Internal Use Only

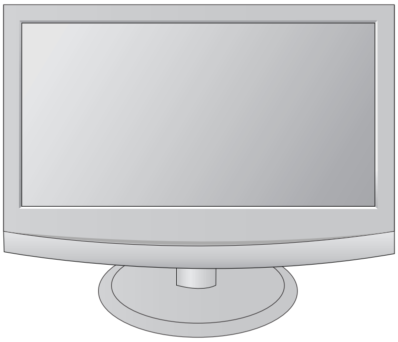
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LCD MONITOR TV
SERVICE MANUAL

CHASSIS : LD93C

MODEL : M227WDP M227WDP-PZL
M237WDP M237WDP-PZL

CAUTION
BEFORE SERVICING THE CHASSIS,
READ THE SAFETY PRECAUTIONS IN THIS MANUAL.



CONTENTS

PRECAUTION

WARNING FOR THE SAFETY-RELATED COMPONENT.

- There are some special components used in LCD monitor that are important for safety. **These parts are marked ⚠ on the schematic diagram and the Exploded View** It is essential that these critical parts should be replaced with the manufacturer's specified parts to prevent electric shock, fire or other hazard.
- Do not modify original design without obtaining written permission from manufacturer or you will void the original parts and labor guarantee.

TAKE CARE DURING HANDLING THE LCD MODULE WITH BACKLIGHT UNIT.

- Must mount the module using mounting holes arranged in four corners.
- Do not press on the panel, edge of the frame strongly or electric shock as this will result in damage to the screen.
- Do not scratch or press on the panel with any sharp objects, such as pencil or pen as this may result in damage to the panel.
- Protect the module from the ESD as it may damage the electronic circuit (C-MOS).
- Make certain that treatment person's body are grounded through wrist band.
- Do not leave the module in high temperature and in areas of high humidity for a long time.
- The module not be exposed to the direct sunlight.
- Avoid contact with water as it may a short circuit within the module.
- If the surface of panel become dirty, please wipe it off with a soft material. (Cleaning with a dirty or rough cloth may damage the panel.)

⚠ CAUTION

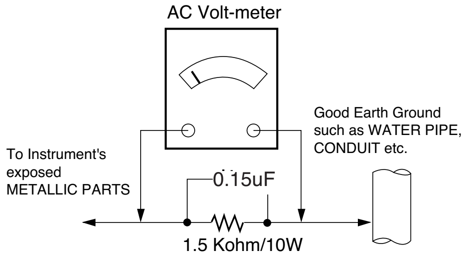
Please use only a plastic screwdriver to protect yourself from shock hazard during service operation.

⚠WARNING

BE CAREFUL ELECTRIC SHOCK !

- If you want to replace with the new backlight (CCFL) or inverter circuit, must disconnect the AC adapter because high voltage appears at inverter circuit about 650Vrms.
- Handle with care wires or connectors of the inverter circuit. If the wires are pressed cause short and may burn or take fire.

Leakage Current Hot Check Circuit



When 25A is impressed between Earth and 2nd Ground for 1 second, Resistance must be less than 0.1 Ω
*Base on Adjustment standard

- **Replaceable batteries**

  * CAUTION
  RISK OF EXPLOSION IF BATTERY IS REPLACED BY AN INCORRECT TYPE.
  DISPOSE OF USED BATTERIES ACCORDING TO THE INSTRUCTIONS

SERVICING PRECAUTIONS

CAUTION: Before servicing receivers covered by this service manual and its supplements and addenda, read and follow the SAFETY PRECAUTIONS on page 3 of this publication.
NOTE: If unforeseen circumstances create conflict between the following servicing precautions and any of the safety precautions on page 3 of this publication, always follow the safety precautions. Remember: Safety First.

General Servicing Precautions

1. Always unplug the receiver AC power cord from the AC power source before;
   a. Removing or reinstalling any component, circuit board module or any other receiver assembly.
   b. Disconnecting or re-connecting any receiver electrical plug or other electrical connection.
   c. Connecting a test substitute in parallel with an electrolytic capacitor in the receiver.
   CAUTION: A wrong part substitution or incorrect polarity installation of electrolytic capacitors may result in an explosion hazard.

2. Test high voltage only by measuring it with an appropriate high voltage meter or other voltage measuring device (DVM, FETVOM, etc) equipped with a suitable high voltage probe.
   Do not test high voltage by "drawing an arc".
3. Do not spray chemicals on or near this receiver or any of its assemblies.
4. Unless specified otherwise in this service manual, clean electrical contacts only by applying the following mixture to the contacts with a pipe cleaner, cotton-tipped stick or comparable non-abrasive applicator; 10% (by volume) Acetone and 90% (by volume) is opropyl alcohol (90%-99% strength)
   CAUTION: This is a flammable mixture.
   Unless specified otherwise in this service manual, lubrication of contacts in not required.
5. Do not defeat any plug/socket B+ voltage interlocks with which receivers covered by this service manual might be equipped.
6. Do not apply AC power to this instrument and/or any of its electrical assemblies unless all solid-state device heat sinks are correctly installed.
7. Always connect the test receiver ground lead to the receiver chassis ground before connecting the test receiver positive lead.
   Always remove the test receiver ground lead last.
8. Use with this receiver only the test fixtures specified in this service manual.
   CAUTION: Do not connect the test fixture ground strap to any heat sink in this receiver.

Electrostatically Sensitive (ES) Devices

Some semiconductor (solid-state) devices can be damaged easily by static electricity. Such components commonly are called Electrostatically Sensitive (ES) Devices. Examples of typical ES devices are integrated circuits and some field-effect transistors and semiconductor "chip" components. The following techniques should be used to help reduce the incidence of component damage caused by static by static electricity.

1. Immediately before handling any semiconductor component or semiconductor-equipped assembly, drain off any electrostatic charge on your body by touching a known earth ground. Alternatively, obtain and wear a commercially available discharging wrist strap device, which should be removed to prevent potential shock reasons prior to applying power to the unit under test.
2. After removing an electrical assembly equipped with ES devices, place the assembly on a conductive surface such as aluminum foil, to prevent electrostatic charge buildup or exposure of the assembly.
3. Use only a grounded-tip soldering iron to solder or unsolder ES devices.
4. Use only an anti-static type solder removal device. Some solder removal devices not classified as "anti-static" can generate electrical charges sufficient to damage ES devices.
5. Do not use freon-propelled chemicals. These can generate electrical charges sufficient to damage ES devices.
6. Do not remove a replacement ES device from its protective package until immediately before you are ready to install it. (Most replacement ES devices are packaged with leads electrically shorted together by conductive foam, aluminum foil or comparable conductive material).
7. Immediately before removing the protective material from the leads of a replacement ES device, touch the protective material to the chassis or circuit assembly into which the device will be installed.
   CAUTION: Be sure no power is applied to the chassis or circuit, and observe all other safety precautions.
8. Minimize bodily motions when handling unpackaged replacement ES devices. (Otherwise harmless motion such as the brushing together of your clothes fabric or the lifting of your foot from a carpeted floor can generate static electricity sufficient to damage an ES device.)

General Soldering Guidelines

1. Use a grounded-tip, low-wattage soldering iron and appropriate tip size and shape that will maintain tip temperature within the range or 500ºF to 600ºF.
2. Use an appropriate gauge of RMA resin-core solder composed of 60 parts tin/40 parts lead.
3. Keep the soldering iron tip clean and well tinned.
4. Thoroughly clean the surfaces to be soldered. Use a mall wire-bristle (0.5 inch, or 1.25cm) brush with a metal handle.
   Do not use freon-propelled spray-on cleaners.
5. Use the following unsoldering technique
   a. Allow the soldering iron tip to reach normal temperature. (500ºF to 600ºF)
   b. Heat the component lead until the solder melts.
   c. Quickly draw the melted solder with an anti-static, suction-type solder removal device or with solder braid.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
6. Use the following soldering technique.
   a. Allow the soldering iron tip to reach a normal temperature (500ºF to 600ºF)
   b. First, hold the soldering iron tip and solder the strand against the component lead until the solder melts.
   c. Quickly move the soldering iron tip to the junction of the component lead and the printed circuit foil, and hold it there only until the solder flows onto and around both the component lead and the foil.
   CAUTION: Work quickly to avoid overheating the circuit board printed foil.
   d. Closely inspect the solder area and remove any excess or splashed solder with a small wire-bristle brush.

IC Remove/Replacement

Some chassis circuit boards have slotted holes (oblong) through which the IC leads are inserted and then bent flat against the circuit foil. When holes are the slotted type, the following technique should be used to remove and replace the IC. When working with boards using the familiar round hole, use the standard technique as outlined in paragraphs 5 and 6 above.

Removal
1. Desolder and straighten each IC lead in one operation by gently prying up on the lead with the soldering iron tip as the solder melts.
2. Draw away the melted solder with an anti-static suction-type solder removal device (or with solder braid) before removing the IC.

Replacement
1. Carefully insert the replacement IC in the circuit board.
2. Carefully bend each IC lead against the circuit foil pad and solder it.
3. Clean the soldered areas with a small wire-bristle brush. (It is not necessary to reapply acrylic coating to the areas).

"Small-Signal" Discrete Transistor Removal/Replacement
1. Remove the defective transistor by clipping its leads as close as possible to the component body.
2. Bend into a "U" shape the end of each of three leads remaining on the circuit board.
3. Bend into a "U" shape the replacement transistor leads.
4. Connect the replacement transistor leads to the corresponding leads extending from the circuit board and crimp the "U" with long nose pliers to insure metal to metal contact then solder each connection.

Power Output, Transistor Device Removal/Replacement
1. Heat and remove all solder from around the transistor leads.
2. Remove the heat sink mounting screw (if so equipped).
3. Carefully remove the transistor from the heat sink of the circuit board.
4. Insert new transistor in the circuit board.
5. Solder each transistor lead, and clip off excess lead.
6. Replace heat sink.

Diode Removal/Replacement
1. Remove defective diode by clipping its leads as close as possible to diode body.
2. Bend the two remaining leads perpendicular y to the circuit board.
3. Observing diode polarity, wrap each lead of the new diode around the corresponding lead on the circuit board.
4. Securely crimp each connection and solder it.
5. Inspect (on the circuit board copper side) the solder joints of the two "original" leads. If they are not shiny, reheat them and if necessary, apply additional solder.

Fuse and Conventional Resistor Removal/Replacement
1. Clip each fuse or resistor lead at top of the circuit board hollow stake.
2. Securely crimp the leads of replacement component around notch at stake top.
3. Solder the connections.
   CAUTION: Maintain original spacing between the replaced component and adjacent components and the circuit board to prevent excessive component temperatures.

Circuit Board Foil Repair

Excessive heat applied to the copper foil of any printed circuit board will weaken the adhesive that bonds the foil to the circuit board causing the foil to separate from or "lift-off" the board. The following guidelines and procedures should be followed whenever this condition is encountered.

At IC Connections

To repair a defective copper pattern at IC connections use the following procedure to install a jumper wire on the copper pattern side of the circuit board. (Use this technique only on IC connections).

1. Carefully remove the damaged copper pattern with a sharp knife. (Remove only as much copper as absolutely necessary).
2. carefully scratch away the solder resist and acrylic coating (if used) from the end of the remaining copper pattern.
3. Bend a small "U" in one end of a small gauge jumper wire and carefully crimp it around the IC pin. Solder the IC connection.
4. Route the jumper wire along the path of the out-away copper pattern and let it overlap the previously scraped end of the good copper pattern. Solder the overlapped area and clip off any excess jumper wire.

At Other Connections

Use the following technique to repair the defective copper pattern at connections other than IC Pins. This technique involves the installation of a jumper wire on the component side of the circuit board.

1. Remove the defective copper pattern with a sharp knife. Remove at least 1/4 inch of copper, to ensure that a hazardous condition will not exist if the jumper wire opens.
2. Trace along the copper pattern from both sides of the pattern break and locate the nearest component that is directly connected to the affected copper pattern.
3. Connect insulated 20-gauge jumper wire from the lead of the nearest component on one side of the pattern break to the lead of the nearest component on the other side.
   Carefully crimp and solder the connections.
   CAUTION: Be sure the insulated jumper wire is dressed so the it does not touch components or sharp edges.

SPECIFICATION

NOTE : Specifications and others are subject to change without notice for improvement.

1. Application Range.

This spec sheet is applied to the 22”/ 23” LCD Monitor TV used LD93C chassis.

2. Specification

Each part is tested as below without special appointment

2.1 Temperature : 25±5°C(77±9°F), CST : 40±5°C
2.2 Relative Humidity : 65±10%
2.3 Power Voltage : Standard input voltage (100~240V@ 50/60Hz)
• Standard Voltage of each products is marked by models
2.4 Specification and performance of each parts are followed each drawing and specification by part number in accordance with BOM .
2.5 The receiver must be operated for about 5 minutes prior to the adjustment.

3. Test method

3.1 Performance : LGE TV test method followed.
3.2 Demanded other specification
Safety : CE, IEC specification
EMC : CE, IEC

Safety : IEC/EN60065
EMI : EN55013
EMS : EN55020

4. Module Specification

4.1 M227WDP-PZL : LGD,LM215WF-TLA1(P/N : EAJ60156901 / P6)

No	Item	Specification	Unit	Remark
1	Type	TFT Color LCD Module		
2	Diagonal Size	21.53 inches diagonal		
3	Active Display area	476.64(H) 268.11(V)	mm	
4	Outline Dimension	495.6(H) x 292.2(V) x16.5(D)	mm	Typ. (Without Inverter)
5	Aspect Ratio	16:9		
6	Pixel Number	1920 x RGB x 1080	pixel	
7	Pixel Pitch	0.248(H) x 0.248(V)	mm	
8	Color arrangement	RGB vertical Stripe		
9	Color Depth	16.7M color (6bit with A-FRC)		
10	Electrical Interface	LVDS 2Port		
11	Surface Treatment	Hard coating(3H) & Anti-glare(Haze 25)		
12	Operating Mode	Normally White		
13	Backlight Unit	4 CCFL (4 lamps)		
14	Response Time	Rising Time : 1.3 + Falling Time : 3.7	ms	Typ.
15	Color Gamut	72%		

4.2 M227WDP-PZL : AUO / M215HW01-V0(P/N : EAJ55729601)

No	Item	Specification	Unit	Remark
1	Type	TFT Color LCD Module		
2	Diagonal Size	21.53 inches(546.86mm) diagonal		
3	Active Display area	476.64(H) 268.11(V)	mm	
4	Outline Dimension	495.6(H) x 292.2(V) x16.35(D)	mm	Typ. (Without Inverter)
5	Aspect Ratio	16:9		
6	Pixel Number	1920 x RGB x 1080	pixel	
7	Pixel Pitch	0.248(H) x 0.248(V)	mm	
8	Color arrangement	RGB vertical Stripe		
9	Color Depth	16.7M color (6bit with Hi-FRC)		
10	Electrical Interface	LVDS 2Port		
11	Surface Treatment	Hard coating(3H) & Anti-glare(Haze 25)		
12	Operating Mode	Normally White		
13	Backlight Unit	4 CCFL (4 lamps)		
14	Response Time	Rising Time : 3.8 + Falling Time : 1.2	ms	Typ.
15	Color Gamut	72%		

4.3 M237WDP-PZL : LGD / LM230WF1-TLA3(P/N : EAJ60682701 / P7, ZBD)
REPLACEMENT MODULE : LGD / LM230WF1-TLA6(P/N: EAJ60682703 / P7, ZBD / Magna Drive IC)

No	Item	Specification	Unit	Remark
1	Type	TFT Color LCD Module		
2	Diagonal Size	23 inches(584.2mm) diagonal		
3	Active Display area	509.184(H) 286.416(V)	mm	
4	Outline Dimension	533.2(H) x 312(V) x16.5(D)	mm	Typ. (Without Inverter)
5	Aspect Ratio	16:9		
6	Pixel Number	1920 x RGB x 1080	pixel	
7	Pixel Pitch	0.265(H) x 0.265(V)	mm	
8	Color arrangement	RGB vertical Stripe		
9	Color Depth	16.7M color		
10	Electrical Interface	LVDS 2Port		
11	Surface Treatment	Hard coating(3H) & Anti-glare(Haze 25)		
12	Operating Mode	Normally White		
13	Backlight Unit	4 CCFL (4 lamps)		
14	Response Time	Rising Time : 1.3 + Falling Time : 3.7	ms	Typ.
15	Color Gamut	72%		

5. General Specification

5.1 TV

No	Item	Specification	Remarks
1	Market	EU(PAL Market-26Countries)	DTV & Analog UK, France, Germany, Spain, Sweden, Finland, Italy, Netherland, Belgium, Czech Luxemburg, Greece, Denmark, Austria, Hungary, Switzerland, Croatia, Turkey Analog Only - Poland, Portugal, Norway, Bulgaria, Serbia,Slovenia, Russia, Romania
2	Broadcasting system	1) PAL-BG 2) PAL-DK 3) PAL-I/I' 4) SECAM L/L' 5) DVB-T	
3	Receiving system	Analog : Upper Heterodyne Digital : COFDM	
4	Scart Jack (2EA)	PAL, SECAM	Scart 1 Jack is Full scart and support RF-OUT(ATV) Scart 2 jack is Half scart and support MNT/DTV-OUT.
5	Component Input (1EA)	Y/Cb/Cr Y/Pb/Pr	
6	RGB Input	RGB-PC	Analog(D-SUB 15Pin)
7	DVI Input	DVI-D	Digital
8	HDMI Input (1EA)	HDMI-DTV	HDMI version 1.3 Support HDCP / Not support PC
9	Audio Input (2EA)	RGB/DVI Audio Component	 L/R Input
10	SPDIF out (1EA)	SPDIF out	
11	Earphone out (1EA)	Antenna, AV1, AV2, Component, RGB, DVI, HDMI	
12	USB (1EA)	Picture, Music	Software Update + Picture + Music
13	RS-232C (1EA)		Commercial Mode

5.2 RGB / DVI

No	Item			Specification				Remarks
1	Supported Sync. Type			Separate Sync., Digital				
2	Operating Frequency			Analog	Horizontal	30 ~ 83kHz		
					Vertical	56 ~ 75 Hz		
				Digital	Horizontal	30 ~ 83kHz		
					Vertical	56 ~ 75 Hz		
3	Resolution			Analog	Max.	1920x1080 @ 60Hz		
					Recommend	1920x1080 @ 60Hz		
				Digital	Max.	1920x1080 @ 60Hz		
					Recommend	1920x1080 @ 60Hz		
4	Input Voltage			Voltage :100 – 240 Vac, 50 or 60Hz				
5	Inrush Current			Cold Start : 50 A Hot : 120 A				
6	Operating Condition			Sync (H/V)	Video	LED	Wattage	
	Power S/W On	On mode	Typ.	On/On	Active	Blue	53W	M227WDP-PZL
			Max	On/On	Active	Blue	60W	
			Typ.	On/On	Active	Blue	55W	M237WDP-PZL
			Max	On/On	Active	Blue	60W	
		Sleep mode		Off/On	Off	Amber	1W	RGB/DIV
				On/Off				
	Power S/W Off	Off mode		-	Off	Off	0.5W	
7	MTBF			50,000 HRS with 90% Confidence leve				22"AUO:40,000 Hours(min) Lamp Life 22"LGD:50,000 Hours(min) 23"LGD:50,000 Hours(min)
8	Using Altitude			5,000 m (for Reliability) 3,000m(for FOS)				
9	Operating Environment			Temp : 10°C ~ 35°C Humidity : 20 % ~ 80 %				
10	Storage Environment			Temp : -10°C~60°C non condensing Humidity : 5 % ~ 90 % non condensing				

6. Chroma & Brightness

6.1 M227WDP – AUO Module (for more details, refer to the module spec.)

No.	Item	Specification		Min.	Typ.	Max.	Remark
1	Viewing Angle[CR>10]	Horizontal		150	170	-	CR >10
		Vertical		140	160		
2	Luminance	Luminance (cd/m2)		240	300	-	
		Variation(%)		75	80		
3	Contrst Ratio	CR		600	1000		Full white/Full black
4	Color Coordinates [CIE1931]	White	W_X	Typ. -0.03	0.313	Typ. +0.03	DVI or RGB Standard, 6500K Full white(100IRE) Backlight 100
			W_Y		0.329		
		RED	R_X		0.648		
			R_Y		0.339		
		Green	G_X		0.282		
			G_Y		0.603		
		Blue	B_X		0.143		
			B_Y		0.070		
5	Response Time(ms)	Rise Time	TrR		3.8	5.5	Condition : DVI or RGB Standard, Backlight100
		Decay Time	TrD		1.2	2.5	

6.2 M227WDP – LGD Module (for more details, refer to the module spec.)

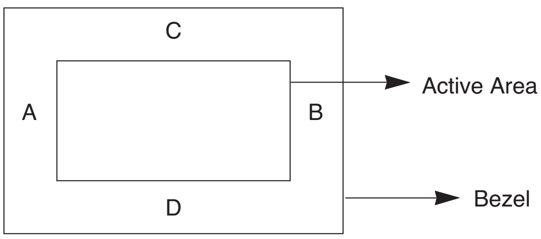
No.	Item	Specification		Min.	Typ.	Max.	Remark
1	Viewing Angle[CR>10]	Right/Left		70/70	85/85	-	CR >10
		Up/Down		60/70	75/85		
2	Luminance	Luminance (cd/m2)		250	300	-	
		Variation(%)		75			
3	Contrst Ratio	CR		700	1000		Full white/Full black
4	Color Coordinates [CIE1931]	White	W_X	Typ. -0.03	0.313	Typ. +0.03	DVI or RGB Standard, 6500K Full white(100IRE) Backlight 100
			W_Y		0.329		
		RED	R_X		0.646		
			R_Y		0.334		
		Green	G_X		0.303		
			G_Y		0.616		
		Blue	B_X		0.147		
			B_Y		0.067		
5	Response Time(ms)	Rise Time	TrR		1.3	2.6	Condition : DVI or RGB Standard, Backlight100
		Decay Time	TrD		3.7	7.4	

6.3 M237WDP – LGD Module (for more details, refer to the module spec.)

No.	Item	Specification		Min.	Typ.	Max.	Remark
1	Viewing Angle[CR>10]	Right/Left		70/70	85/85	-	CR >10
		Up/Down		60/70	75/85		
2	Luminance	Luminance (cd/m2)		250	300	-	
		Variation(%)		75			
3	Contrst Ratio	CR		700	1000		Full white/Full black
4	Color Coordinates [CIE1931]	White	W_X		0.313		
			W_Y	Typ.	0.329	Typ.	
		RED	R_X	-0.03	0.644	+0.03	DVI or RGB
			R_Y		0.336		Standard, 6500K
		Green	G_X		0.301		Full white(100IRE)
			G_Y		0.611		Backlight 100
		Blue	B_X		0.146		
			B_Y		0.070		
5	Response Time(ms)	Rise Time	TrR		1.3	2.6	Condition : DVI or RGB
		Decay Time	TrD		3.7	7.4	Standard, Backlight100

* Optical Test Condition
- Surrounding Brightness Level : dark
- Surrounding Temperature : 25±5°C
- warm-up Time : 30 Min
- Contrast, Brightness : Outgoing condition
- *Incase of Vivid Mode, high level saturation may be occurred. Check gray linearity at standard mode.

* Active area
1. Active area of LCD PANEL is in bezel of cabinet.
2. Interval between active area and bezel
   lA-Bl<1.0 mm , lC-Dl<1.0 mm
   A: Interval between left of active area and bezel
   B: Interval between right of active area and bezel
   C: Interval between top of active area and bezel
   D: Interval between bottom of active area and bezel



7. SET Optical Feature

7.1 PC Mode (-Mode : Outgoing condition, Input signal : 100IRE White pattern(Pattern #4 : MSPG series))

No	Item	module	Luminance (cd/m²)			C/R(min)		Remark
			Min	Typ	Max	Min	Typ	
1	22/23 inch	-	240	230	-	600	700	RGB & DVI DFC 50000:1

*If input signal is 100 IRE full white pattern, the luminance and color coordinate will depend on the panel.
When testing DFC, please wait for at least 1 minutes after checking luminance at black pattern.

7.2 AV Mode (-Mode : Outgoing condition, Input signal : 100IRE White pattern(Pattern #4 : MSPG series))

No	Item	module	Luminance (cd/m²)			C/R(min)	Remark
			Min	Typ	Max	RF,AV, COMPONENT,HDMI	
1	22/23 inch	-	170	200	-	500	RF,AV,COMPONENT,HDMI Test condition

7.3 Special feature(DFC)
-DFC Working Condition : Full Black Pattern(All Black, No pattern(MSPG Pattern#2)) signal in D-sub & DVI

No	Item	module	Min	Typ	Max	Remark
1	22/23 inch		40000:1	50000:1		PC Mode(D-sub, DVI) , Mode : Outgoing condition Input signal : 100 IRE Full white pattern

8. Component Video Input (Y, P_B, P_R)

No.	Specification				Remark
	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	
1.	720*480	15.73	59.94	13.500	SDTV, DVD 480I(525I)
2.	720*480	15.75	60.00	13.514	SDTV, DVD 480I(525I)
3.	720*576	15.625	50.00	13.500	SDTV, DVD 576I(625I) 50Hz
4.	720*480	31.47	59.94	27.000	SDTV 480P
5.	720*480	31.50	60.00	27.027	SDTV 480P
6.	720*576	31.25	50.00	27.000	SDTV 576P 50Hz
7.	1280*720	44.96	59.94	74.176	HDTV 720P
8.	1280*720	45.00	60.00	74.250	HDTV 720P
9.	1280*720	37.50	50.00	74.25	HDTV 720P 50Hz
10.	1920*1080	33.72	59.94	74.176	HDTV 1080I
11.	1920*1080	33.75	60.00	74.250	HDTV 1080I
12.	1920*1080	28.125	50.00	74.250	HDTV 1080I 50Hz,
13.	1920*1080	56.25	50	148.5	HDTV 1080P
14.	1920*1080	67.432	59.94	148.350	HDTV 1080P
15.	1920*1080	67.5	60.00	148.5	HDTV 1080P

9. RGB Input (PC)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Remark
1.	720*400	31.468	70.08	28.321	
2.	640*480	31.469	59.94	25.175	
3.	640*480	37.5	75	31.5	
4.	800*600	37.879	60.317	40.0	
5.	800*600	46.875	75.0	49.5	
6.	1024*768	48.363	60.0	65.0	
7.	1024*768	60.123	75.029	78.75	
8.	1152*864	67.500	75.000	108.0	
9.	1280*1024	63.981	60.02	108.0	
10.	1280*1024	79.976	75.035	135.0	
11.	1680*1050	64.674	59.883	119.0	
12.	1680*1050	65.290	59.954	146.25	
13.	1600*1200	75.0	60.0	162.0	
14.	1920*1080	66.587	59.934	138.5	

10. RGB EDID Data

10.1 M227WDP(Product ID : 22388)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	74	57	01	01	01	01
10	01 * *	13	01	03	68	30	1B	78	EA	AB	D5	A5	55	4D	9D	25
20	11	50	54	A5	6B	80	81	80	81	8F	71	40	B3	00	81	4F
30	71	4F	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	56	50	21	00	00	1A	00	00	00	FD	00	38	4B	1E
50	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC	00	4D
60	32	32	37	57	44	50	0A	20	20	20	20	20	00	00	00	FC
70	00	0A	20	20	20	20	20	20	20	20	20	20	20	20	00	00 * *

10.2 M237WDP(Product ID : 22391)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	77	57	01	01	01	01
10	01 * *	13 * *	01	03	68	33	1D	78	EA	C2	85	A4	56	4D	9C	25
20	12	50	54	A5	6B	80	81	80	81	8F	71	40	B3	00	81	4F
30	71	4F	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	56	50	21	00	00	1A	00	00	00	FD	00	38	4B	1E
50	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC	00	4D
60	32	33	37	57	44	50	0A	20	20	20	20	20	00	00	00	FC
70	00	0A	20	20	20	20	20	20	20	20	20	20	20	20	00 *	* 30

11. DVI Input (PC)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Remark
1.	720*400	31.468	70.08	28.321	
2.	640*480	31.469	59.94	25.175	
3.	640*480	37.5	75	31.5	
4.	800*600	37.879	60.317	40.0	
5.	800*600	46.875	75.0	49.5	
6.	1024*768	48.363	60.0	65.0	
7.	1024*768	60.123	75.029	78.75	
8.	1152*864	67.500	75.000	108.0	
9.	1280*1024	63.981	60.02	108.0	
10.	1280*1024	79.976	75.035	135.0	
11.	1680*1050	64.674	59.883	119.0	
12.	1680*1050	65.290	59.954	146.25	
13.	1600*1200	75.0	60.0	162.0	
14.	1920*1080	66.587	59.934	138.5	

12. DVI EDID Data

12.1 M227WDP(Product ID : 22389)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	75	57	01	01	01	01
10	01 **	13 **	01	03	80	30	1B	78	EA	AB	D5	A5	55	4D	9D	25
20	11	50	54	A5	6F	80	81	80	81	8F	71	40	B3	00	81	4F
30	71	4F	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	56	50	21	00	00	1A	21	39	90	30	62	1A	27	40
50	68	B0	36	00	56	50	21	00	00	1C	00	00	00	FD	00	38
60	4B	1E	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4D	32	32	37	57	44	50	0A	20	20	20	20	20	00 **	3B

12.2 M237WDP(Product ID : 22392)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	78	57	01	01	01	01
10	01 **	13 **	01	03	80	33	1D	78	EA	C2	85	A4	56	4D	9C	25
20	12	50	54	A5	6F	80	81	80	81	8F	71	40	B3	00	81	4F
30	71	4F	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	56	50	21	00	00	1A	21	39	90	30	62	1A	27	40
50	68	B0	36	00	56	50	21	00	00	1C	00	00	00	FD	00	38
60	4B	1E	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4D	32	33	37	57	44	50	0A	20	20	20	20	20	00 **	6B

13. HDMI input (DTV) (Not Support PC)

No.	Resolution	H-freq(kHz)	V-freq(Hz)	Pixel clock(MHz)	Proposed
1.	720*480	31.469 / 31.5	59.94 / 60	27.00/27.03	SDTV 480P
2.	720*576	31.25	50	27.864	SDTV 576P
3.	1280*720	37.500	50	74.25	HDTV 720P
4.	1280*720	44.96 / 45	59.94 / 60	74.17/74.25	HDTV 720P
5.	1920*1080	33.72 / 33.75	59.94 / 60	74.17/74.25	HDTV 1080I
6.	1920*1080	28.125	50.00	74.25	HDTV 1080I
7.	1920*1080	27	24	74.25	HDTV 1080P
8.	1920*1080	33.75	30.00	74.25	HDTV 1080P
9.	1920*1080	56.250	50	148.5	HDTV 1080P
10.	1920*1080	67.43 / 67.5	59.94 / 60	148.35/148.50	HDTV 1080P

14. HDMI1/2 EDID Data

14.1 M227WDP (Product ID : 22390)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	76	57	01	01	01	01
10	01**	13**	01	03	80	30	1B	78	0A	AB	D5	A5	55	4D	9D	25
20	11	50	54	A5	6F	00	81	80	81	8F	71	40	B3	00	81	4F
30	71	4F	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	56	50	21	00	00	1A	21	39	90	30	62	1A	27	40
50	68	B0	36	00	56	50	21	00	00	1C	00	00	00	FD	00	38
60	4B	1E	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4D	32	32	37	57	44	50	0A	20	20	20	20	20	01 *	*99
80	02	03	22	F1	4E	84	05	03	02	20	22	10	11	13	12	14
90	1F	07	16	26	15	07	50	09	07	07	67	03	0C	00	10	00
A0	B8	2C	01	1D	00	72	51	D0	1E	20	38	88	15	00	56	50
B0	21	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00
C0	56	50	21	00	00	9E	8C	0A	D0	8A	20	E0	2D	10	10	3E
D0	96	00	56	50	21	00	00	18	8C	0A	D0	8A	20	E0	2D	10
E0	10	3E	96	00	56	50	21	00	00	18	02	3A	80	18	71	38
F0	2D	40	58	2C	45	00	56	50	21	00	00	1E	00	00	00	*79*

14.2 M237WDP (Product ID : 22393)

	00	01	02	03	04	05	06	07	08	09	0A	0B	0C	0D	0E	0F
00	00	FF	FF	FF	FF	FF	FF	00	1E	6D	79	57	01	01	01	01
10	01 **	13 **	01	03	80	33	1D	78	0A	C2	85	A4	56	4D	9C	25
20	12	50	54	A5	6F	00	81	80	81	8F	71	40	B3	00	81	4F
30	71	4F	01	01	01	01	1A	36	80	A0	70	38	1F	40	30	20
40	35	00	56	50	21	00	00	1A	21	39	90	30	62	1A	27	40
50	68	B0	36	00	56	50	21	00	00	1C	00	00	00	FD	00	38
60	4B	1E	53	11	00	0A	20	20	20	20	20	20	00	00	00	FC
70	00	4D	32	33	37	57	44	50	0A	20	20	20	20	20	01 *	* C9
80	02	03	22	F1	4E	84	05	03	02	20	22	10	11	13	12	14
90	1F	07	16	26	15	07	50	09	07	07	67	03	0C	00	10	00
A0	B8	2C	01	1D	00	72	51	D0	1E	20	38	88	15	00	56	50
B0	21	00	00	1E	01	1D	80	18	71	1C	16	20	58	2C	25	00
C0	56	50	21	00	00	9E	8C	0A	D0	8A	20	E0	2D	10	10	3E
D0	96	00	56	50	21	00	00	18	8C	0A	D0	8A	20	E0	2D	10
E0	10	3E	96	00	56	50	21	00	00	18	02	3A	80	18	71	38
F0	2D	40	58	2C	45	00	56	50	21	00	00	1E	00	00	00	** 79

15. Mechanical specification

15.1 M227WDP-PZL

No.	Item		Content				Unit	Remark
1.	Product Dimension		Width(W)	Length(D)	Height(H)		mm	
		Before Packing	519.8	193.2	400.5		mm	
		After Packing	592	446	135		mm	
2.	Product Weight	Only SET	4.7				Kg	
		With BOX	6.3				Kg	
3.	Container Loading Quantity	Individual or Palletizing	20ft		40ft			
			Indi.	Wooden	Indi.	Wooden		
			816	600	1700	1380		
4.	Stand Assy	Type	Detachable (Base detachable)					
		Size(W x D x H)	271.2x 193.2x 108.4					
		Tilt Degree	-5~15 degree					
		Tilt force	0.8~3.5kgf					
		Swivel Degree Swivel Force	none					
5.	Appearance	General	Refer to Standard of LG(55)G1-1020					*Appearance Gap spec Front: 0.5 mm ↓ Back & Bottom : 1.0 m ↓

15.2 M237WDP-PZL

No.	Item		Content				Unit	Remark
1.	Product Dimension		Width(W)	Length(D)	Height(H)		mm	
		Before Packing	560.8	193.2	427		mm	
		After Packing	651	456	161		mm	
2.	Product Weight	Only SET	5.6				Kg	
		With BOX	7.4				Kg	
3.	Container Loading Quantity	Individual or Palletizing	20ft		40ft			
			Indi.	Wooden	Indi.	Wooden		
			630	560	1290	1176		
4.	Stand Assy	Type	Detachable (Base detachable)					
		Size(W x D x H)	271.2x 193.2x 108.4					
		Tilt Degree	-5~15 degree					
		Tilt force	0.8~3.5kgf					
		Swivel Degree Swivel Force	none					
5.	Appearance	General	Refer to Standard of LG(55)G1-1020					*Appearance Gap spec Front: 0.5 mm ↓ Back & Bottom : 1.0 m ↓

ADJUSTMENT INSTRUCTION

1. Application

This document is applied to LD84G chassis 22” LCD Monitor TV which is manufactured in Monitor Factory or is produced on the basis of this data.

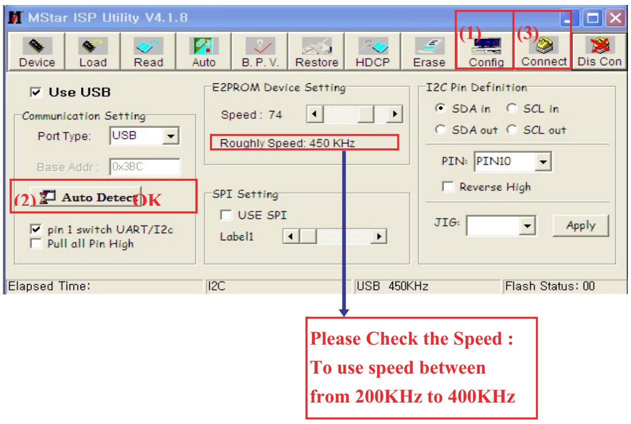
2. Designation

2.1 The adjustment is according to the order which is designated and which must be followed, according to the plan which can be changed only on agreeing.
2.2. Power Adjustment: Free Voltage
2.3. Magnetic Field Condition: Nil.
2.4. Input signal Unit: Product Specification Standard
2.5. Reserve after operation: Above 5 Minutes (Heat Run)
Temperature : at 25°C±5°C
Relative humidity : 65 ±10%
Input voltage : 220V, 60Hz
2.6. Adjustment equipment: Color Analyzer (CA-210 or CA-110), Pattern Generator (MSPG-925L or Equivalent), DDC Adjustment Jig equipment, SVC remote controller
2.7. Don’t push The **“IN STOP KEY”** after completing the function inspection.

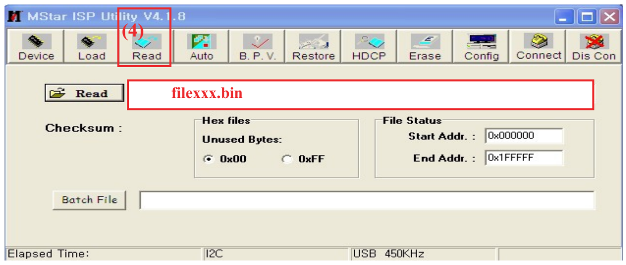
3. Main PCB check process

• APC - After Manual-Insult, executing APC

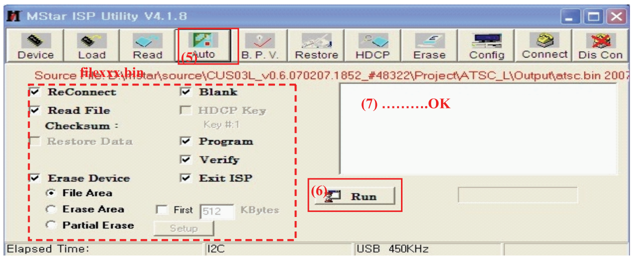
• Download
1. Execute ISP program "Mstar ISP Utility" and then click "Config" tab.
2. Set as below, and then click "Auto Detect" and check "OK" message.
If display "Error", Check connect computer, jig, and set.
3. Click "Connect" tab.
If display "Can’t ", Check connect computer, jig, and set.



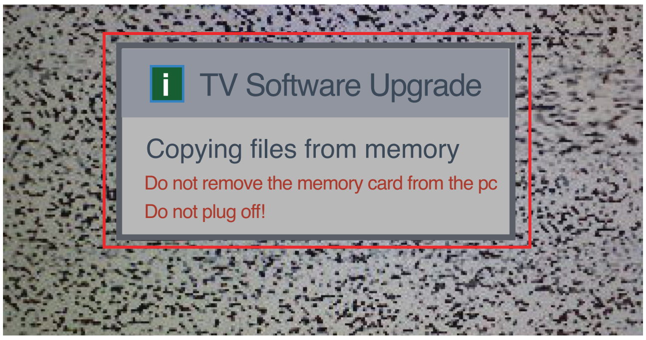
4. Click "Read" tab, and then load download file(XXXX.bin) by clicking "Read"



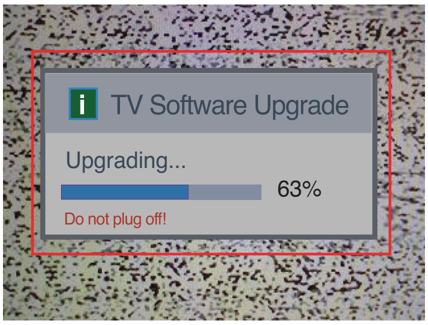
5. Click "Auto" tab and set as below
6. Click "Run".
7. After downloading, check "OK" message.

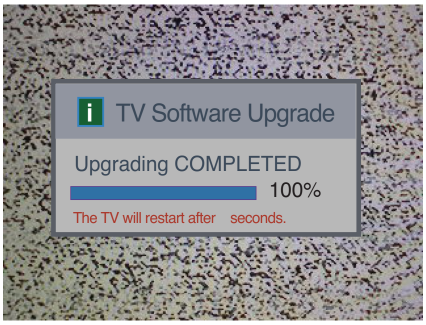


• USB DOWNLOAD
1. Put the USB Stick to the USB socket
2. Automatically detecting update file in USB Stick
   - If your downloaded program version in USB Stick is Low, it didn't work. But your downloaded version is High, USB data is automatically detecting
3. Show the message "Copying files from memory"



4. Updating is staring.





5. Updating Completed, The TV will restart automatically.
6. If your TV is turned on, check your updated version and Tool option. (explain the Tool option, next stage)

* If downloading version is more high than your TV have, TV can lost all channel data. In this case, you have to channel recover. if all channel data is cleared, you didn't have a DTV/ATV test on production line.

• After downloading, have to adjust TOOL OPTION again.
1. Push "ADJ " key in service remote controller
2. Select "Tool Option 1" and Push "OK" button
3. Punch in the number. (Each model has their number.)
4. Completed selecting Tool option

3.1 ADC Process

3.1.1 PC input ADC

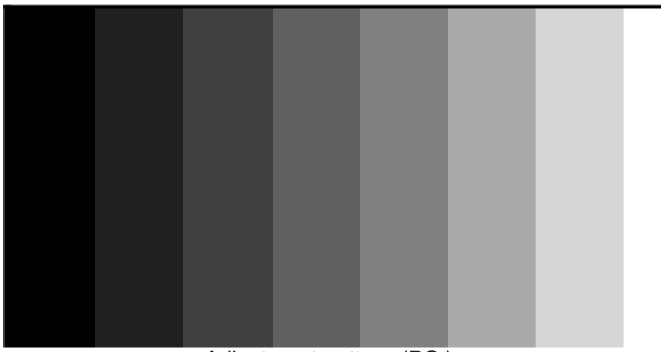
3.1.1.1 Auto RGB Gain/Offset Adjustment
- Convert to PC in Input-source
- Signal equipment displays

  Output Voltage: 700 m Vp-p

  Impress Resolution XGA (1024 x 768 @ 60Hz)

  Model : 60 in Pattern Generator

  Pattern : 29 in Pattern Generator (MSPG-925 SERIES)

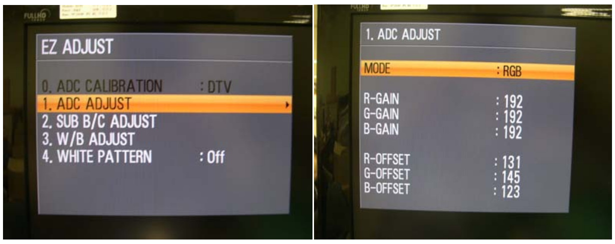


Adjustment pattern (PC)

- Adjust by commanding AUTO_COLOR_ADJUST.

3.1.1.2 Confirmation
- We confirm whether "0xAA (RGB)" address of EEPROM "0xA2" is "0xAA" or not.
- If "0xAA (RGB)" address of EEPROM "0xA2" isn't "0xAA", we adjust once more
- We can confirm the ADC values from "0xA4~0XA9 (RGB)" addresses in a page "0xA2"

*Manual ADC process using Service Remocon. After enter Service Mode by pushing "ADJ" key,
execute "ADC Adjust" by pushing "▶" key at "ADC CALIBRATION: RGB".



3.1.2 COMPONENT input ADC

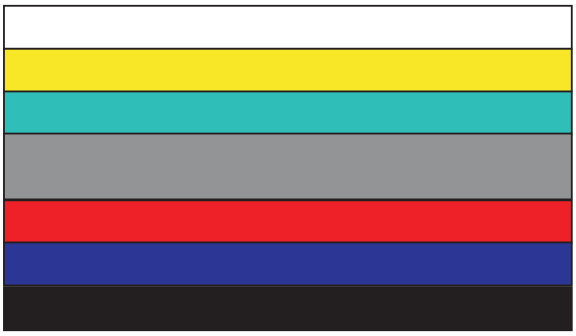
3.1.2.1 Component Gain/Offset Adjustment

- Convert to Component in Input-source
- Signal equipment displays

  Impress Resolution 1080i

  Model: 223 in Pattern Generator(1080i Mode)

  Pattern : 65 in Pattern Generator(MSPG-925 SERIES)



Adjustment pattern (COMPONENT)

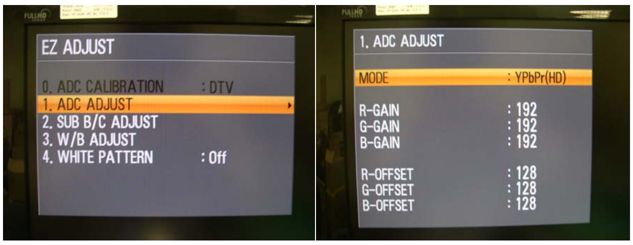
- Adjust by commanding AUTO_COLOR_ADJUST.

3.1.2.2 Confirmation

- We confirm whether "0xB3 (480i)/0xBC (1080i)" address of EEPROM "0xA2" is "0xAA" or not.
- If "0xB3 (480i)/0xBC(1080i)" address of EEPROM "0xA2" isn't "0xAA", we adjust once more
- We can confirm the ADC values from "0xAD~0xB2 (480i)/0XB6~BB (1080i)" addresses in a page "0xA2"

*Manual ADC process using Service Remocon. After enter Service Mode by pushing "ADJ" key,
execute "ADC Adjust" by pushing "▶" key at "ADC CALIBRATION :COMPONENT".

Impress Resolution 1080i



3.2 Function Check

3.2.1 Check display and sound

-Check Input and Signal items. (cf. work instructions)

1. TV
2. AV (SCART1/SCART2/CVBS/S-Video)
3. COMPONENT (1080i)
4. RGB (PC : 1920x1080 @ 60Hz)
5. DVI (PC : 1920x1080 @ 60Hz)
6. HDMI
6. PC Audio In

* Display and Sound check is executed by Remote controller.

4. Total Assembly line process

4.1 Adjustment Preparation

- W/B Equipment condition

  CA210: CH 9, Test signal: Inner pattern (85IRE)
- Above 5 minutes H/run in the inner pattern. ("power on" key of adjust remote control)
- 15 Pin D-Sub Jack is connected to the AUTO W/B EQUIPMENT.
- Adjust Process will start by execute I2C Command (Inner pattern (0xF3, 0xFF).

Color Temperature	Cool		9,300k		°K	X=0.283 (±0.015) Y=0.298 (±0.015)	M197WDP M227WDP M237WDP	<Test Signal> Inner pattern (216gray,85IRE)
	Medium		8,000k		°K	X=0.295 (±0.015) Y=0.305 (±0.015)		
	Warm		6,500k		°K	X=0.313 (±0.015) Y=0.329 (±0.015)		
Luminance (cd/m²)	Cool		Min : 120			Typ : 170	M197WDP	<Test Signal> Inner pattern (216gray,85IRE)
	Medium		Min : 120			Typ : 170		
	Warm		Min : 120			Typ : 170		
	Cool		Min : 170			Typ : 220	M227WDP M237WDP	
	Medium		Min : 170			Typ : 220		
	Warm		Min : 170			Typ : 220		

- Adjust Process will finish by execute I2C Command (Inner pattern (Inner pattern (0xF3,0x00)).

** Caution **

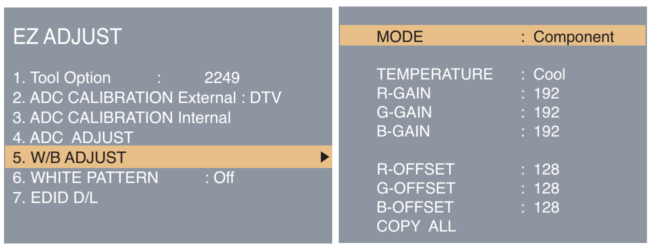
Color Temperature: COOL, Medium, Warm

One of R Gain/G Gain/ B Gain should be kept on 0xC0, and adjust other two lower than C0.

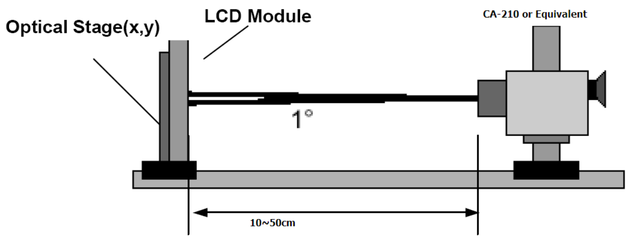
(when R/G/B Gain are all C0, it is the FULL Dynamic Range of Module)

* W/B condition
- Surrounding Temperature : 20 % ~ 80 %
- Surrounding Temperature : 25±5 °C
- warm-up Time : Under 5 Min.

*Manual W/B process using adjusts Remote control.
- After enter Service Mode by pushing "ADJ" key,
- Enter White Pattern off of service mode, and change off -> on.
- Enter "W/B ADJUST" by pushing "▶" key at "5. W/B ADJUST".



* After done all adjustments, Press “In-start” button and compare Tool option and Area option value with its BOM, if it is correctly same then unplug the AC cable.
  If it is not same, then correct it same with BOM and unplug AC cable.
  For correct it to the model’s module from factory JIG model.
* Don’t push The “IN STOP KEY” after completing the function inspection.
* When doing Adjustment, Please make circumstance as below.



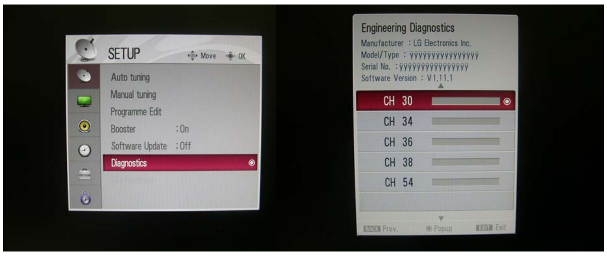
4.2 DPM operation confirmation (Only Apply for MNT Model)
• Check if Power LED Color and Power Consumption operate as standard.
  - Set Input to RGB and connect D-sub cable to set
  - Measurement Condition: (100~240V@ 50/60Hz)
  - Confirm DPM operation at the state of screen without Signal

4.3 DDC EDID Write (RGB 128Byte)
  - Connect D-sub Signal Cable to D-Sub Jack.
  - Write EDID DATA to EEPROM (24C02) by using DDC2B protocol.
  - Check whether written EDID data is correct or not.

4.4. DDC EDID Write (DVI 128Byte)
  - Connect DVI-D Signal Cable to DVI Jack.
  - Write EDID DATA to EEPROM (240C02) by using DDC2B protocol.
  - Check whether written EDID data is correct or not.

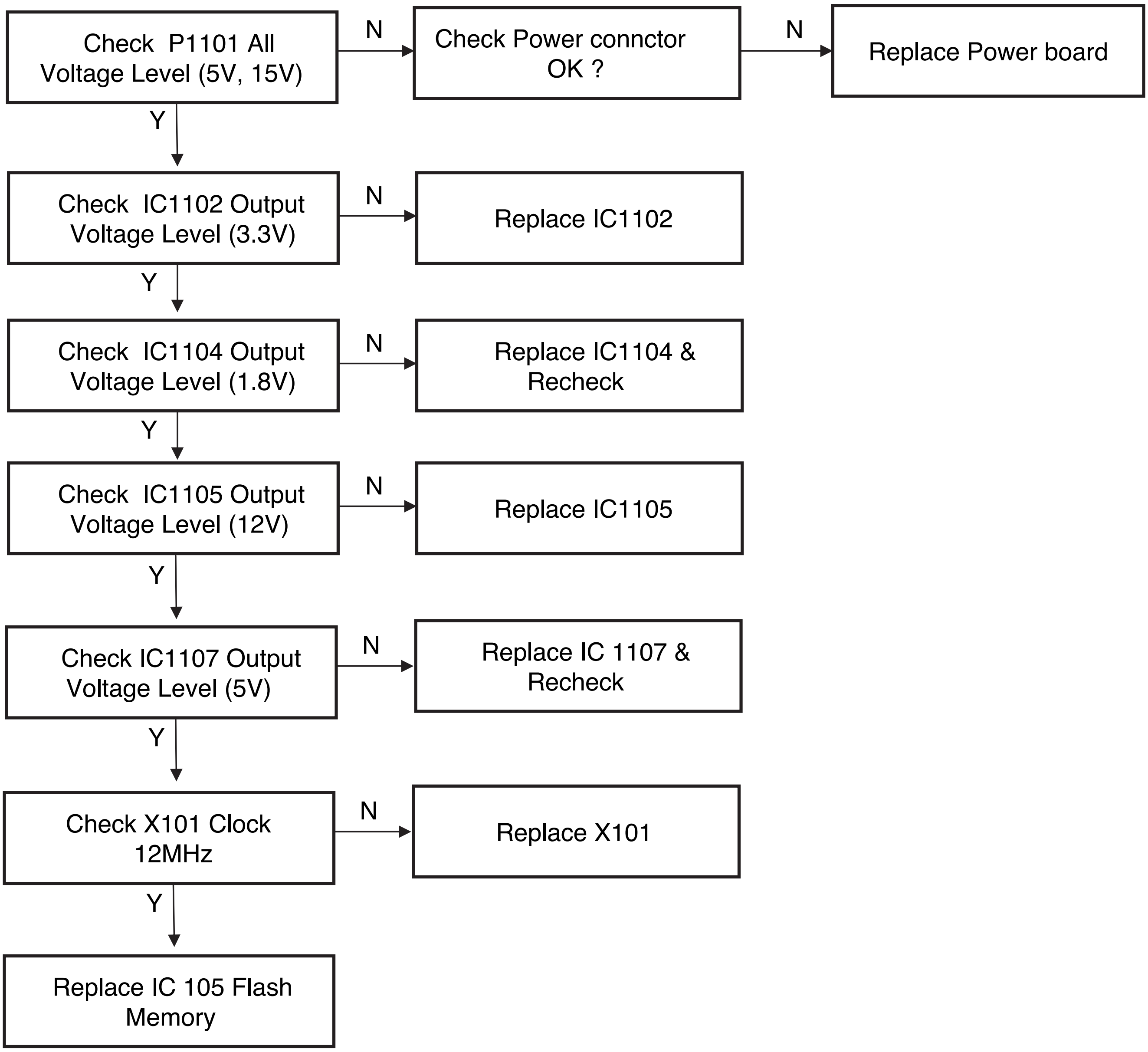
4.5. DDC EDID Write (HDMI 256Byte)
  - Connect HDMI Signal Cable to HDMI Jack.
  - Write EDID DATA to EEPROM(24C02) by using DDC2B protocol.
  - Check whether written EDID data is correct or not

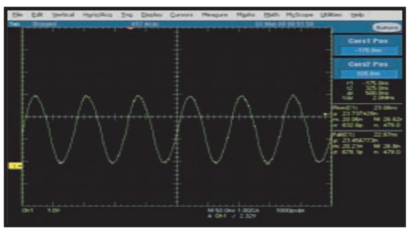
4.6. Serial number (RS-232C)
  - Press "Power on" key of service remocon.(Baud rate : 115200 bps)
  - Connect RS232 Signal Cable to RS-232 Jack.
  - Write Serial number by use RS-232.
  - Must check the serial number at the Diagnostics of SET UP menu. (Refer to below).



TROUBLESHOOTING

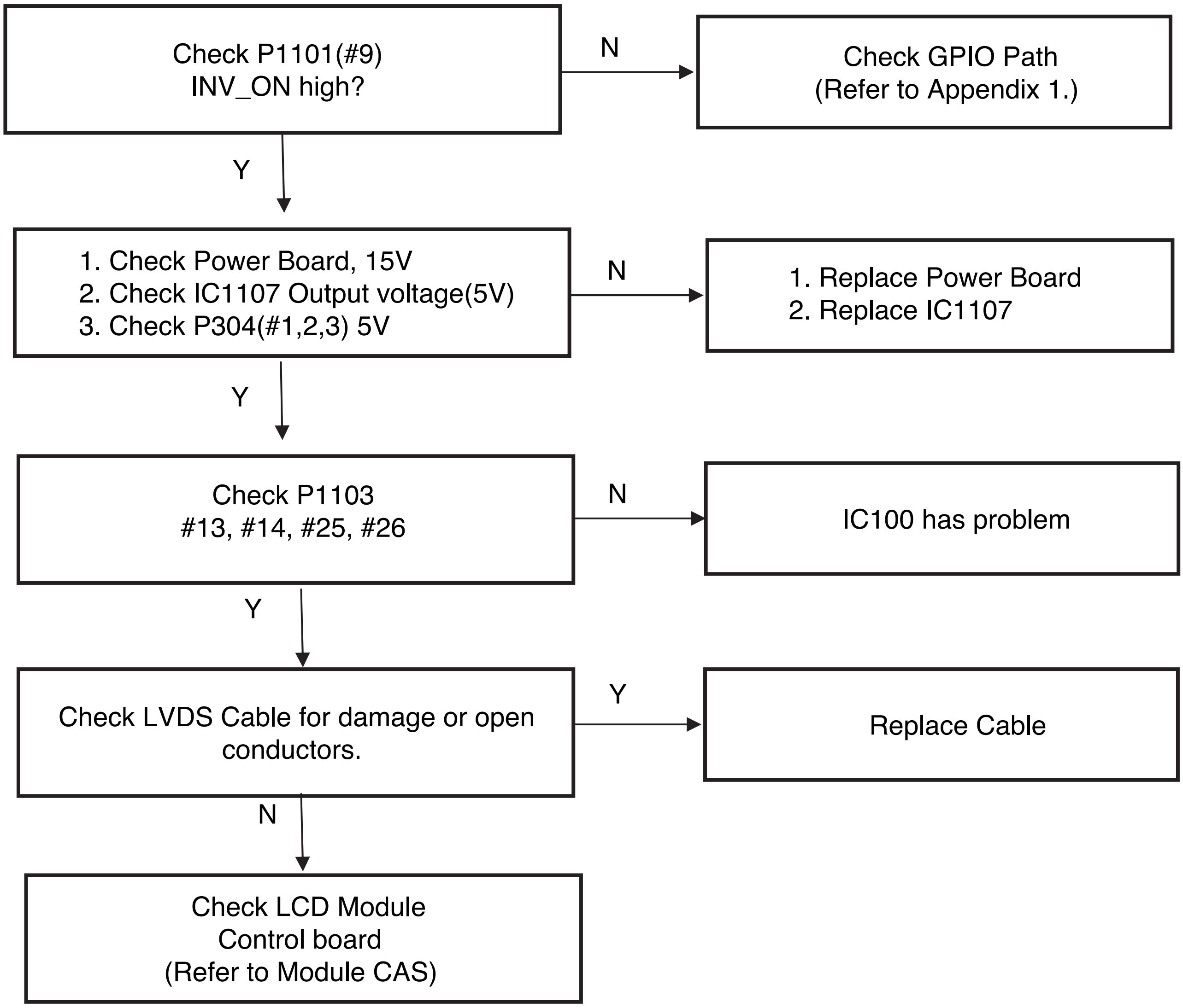
1. Power- Up Boot Fail Trouble Shooting





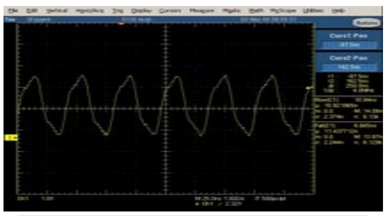
Wave form of X101

2. No OSD Trouble Shooting



3. Digital TV Video Trouble Shooting

- Check RF Cable
  - Y → Check Tuner 5V Power & Q1105 5V
    - N → Replace Q1105
    - Y → Check LD500 color
      - Yellow -> none → Bad Tuner. Replace Tuner.
      - None → Check TP Clock, Data, Sync R521, R532, R533
        - N → Mabe Tuner(IC500) has problems
        - Y → Check Demodulator Input Clock X500 (31.875MHz),X501 (20.48MHz)
          - N → Replace X500 Replace X501
          - Y → Check P1103 #13, #14, #25, #26
            - N → Place IC100 has problems
            - Y → Check LCD Module Control board Refer to Module CAS



Wave form of X500

4. Component Video Trouble Shooting

Check input signal format
Is it supported?

↓ Y

Check Component Cable

↓ Y

Check JK700 → N → Replace JK602 or Check Divice

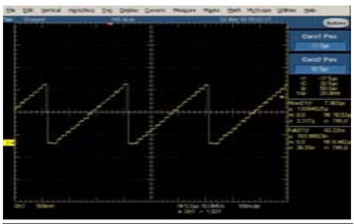
↓ Y

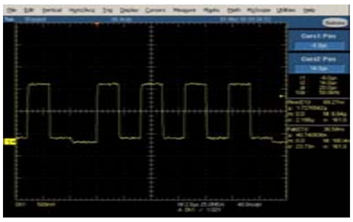
Check signal
C1121,C122,C123 → N → Check R164, R144, R145
C1121, C122, C123

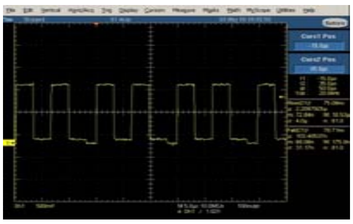
↓ Y

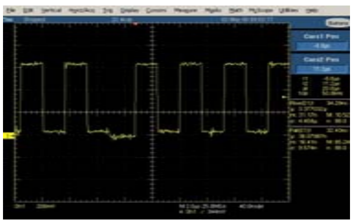
IC100 has problem

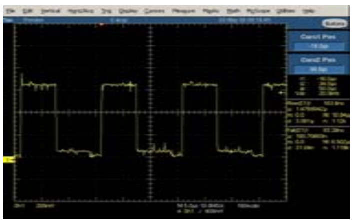
The Waveforms depend on input signal

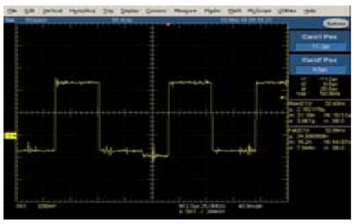

Wave form of Comp Y


Wave form of Comp Pb


Wave form of Comp Pr


Wave form of C121


Wave form of C122


Wave form of C123

5. RGB Video Trouble Shooting

Check input signa format
Is it supported?

↓ Y

Check RGB Cable connector
for damage

↓ Y

Check JK703 → N → Replace JK703

↓ Y

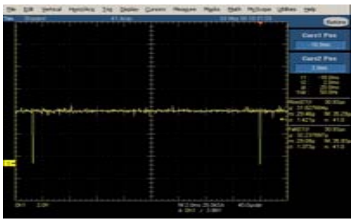
Check signal, Hsync, Vsync
(R729, R730) → N → Replace R729, R730

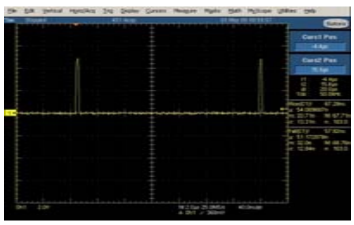
↓ Y

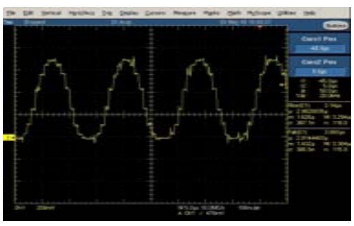
Check signal RGB
(R158, R160, R162)
C115, C117, C119) → N → Replace R158, R160, R162,
C115, C117, C119

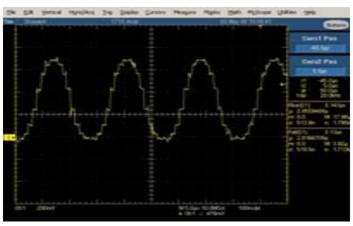
↓ Y

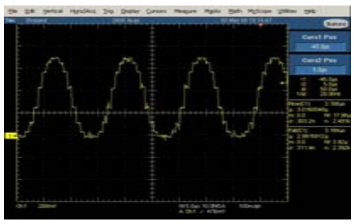
IC100 has problem


Wave form of R730(Vsync)


Wave form of R729(Hsync)


Wave form of R158/ C115


Wave form of R160/ C117


Wave form of R162/ C119

6. AV Video Trouble Shooting

Check input signal format
Is it supported?

↓ Y

Check AV Cable / S-Video Cable for
damage or open connector

↓ Y

Check signal R611(AV_CVBS),
R625, R626(S_Video)

→ N: Replace R611, R625, R626

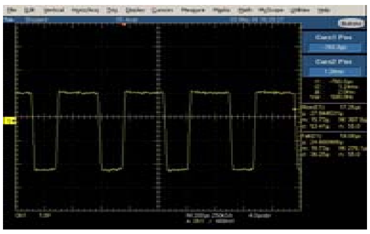
↓ Y

Check signal RGB
R116, R113, R114
C137, C134, C135

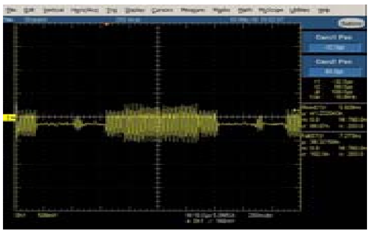
→ N: Replace R116, R113, R114
C137, C134, C135

↓ Y

IC101 has problem



Wave form of R611(CVBS)

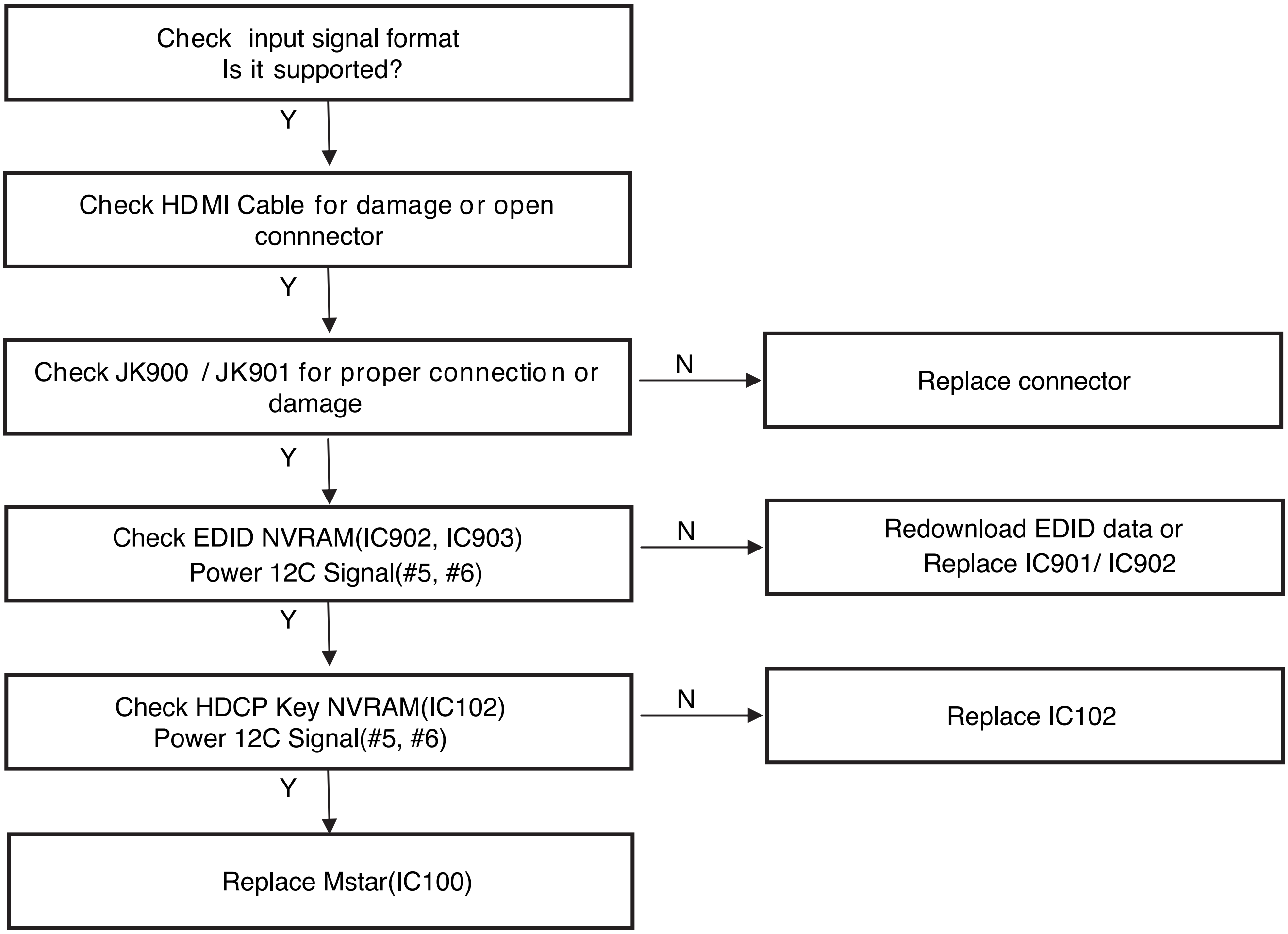


Wave form of R625(S-video)

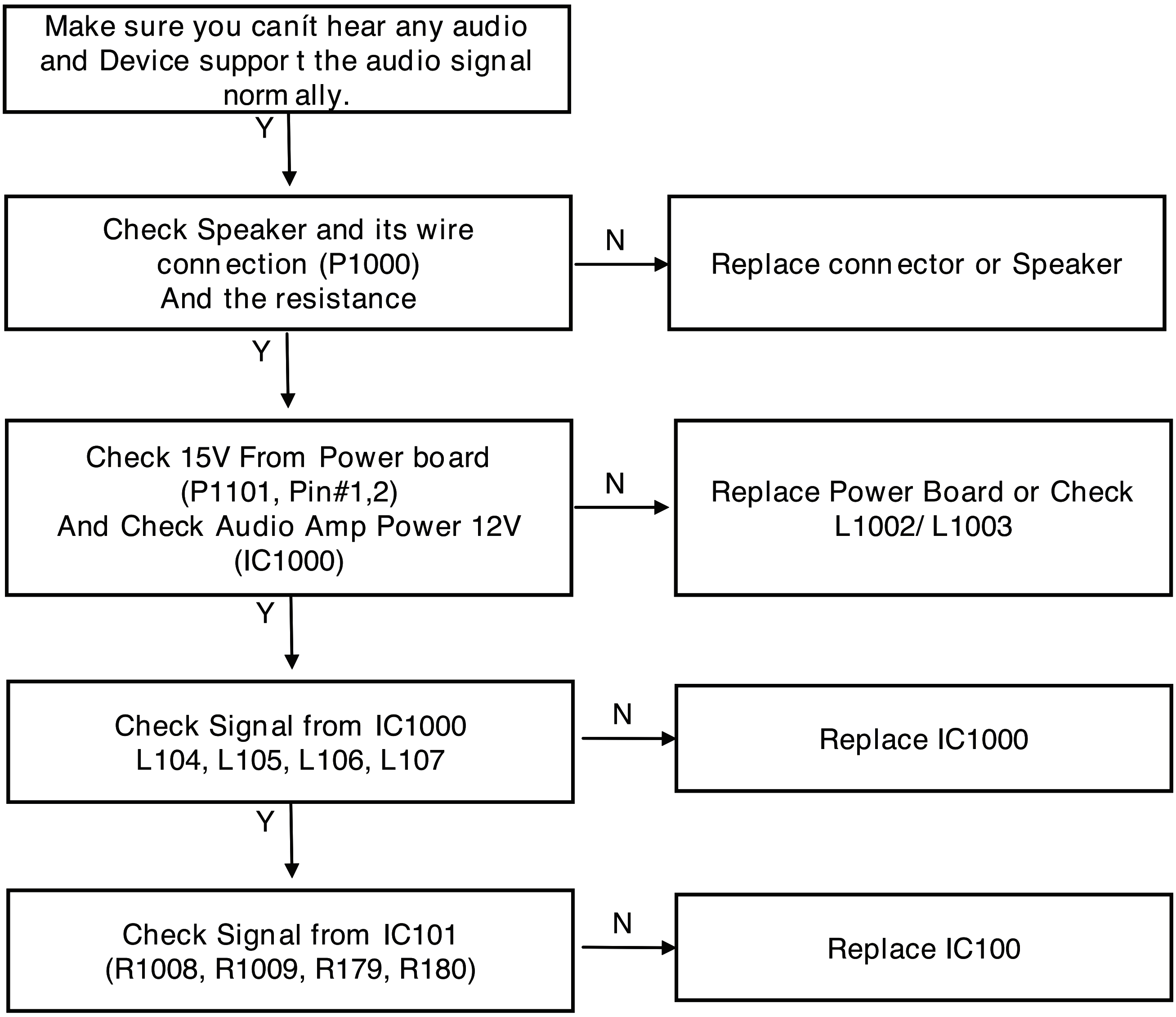


Wave form of R626(S-video)

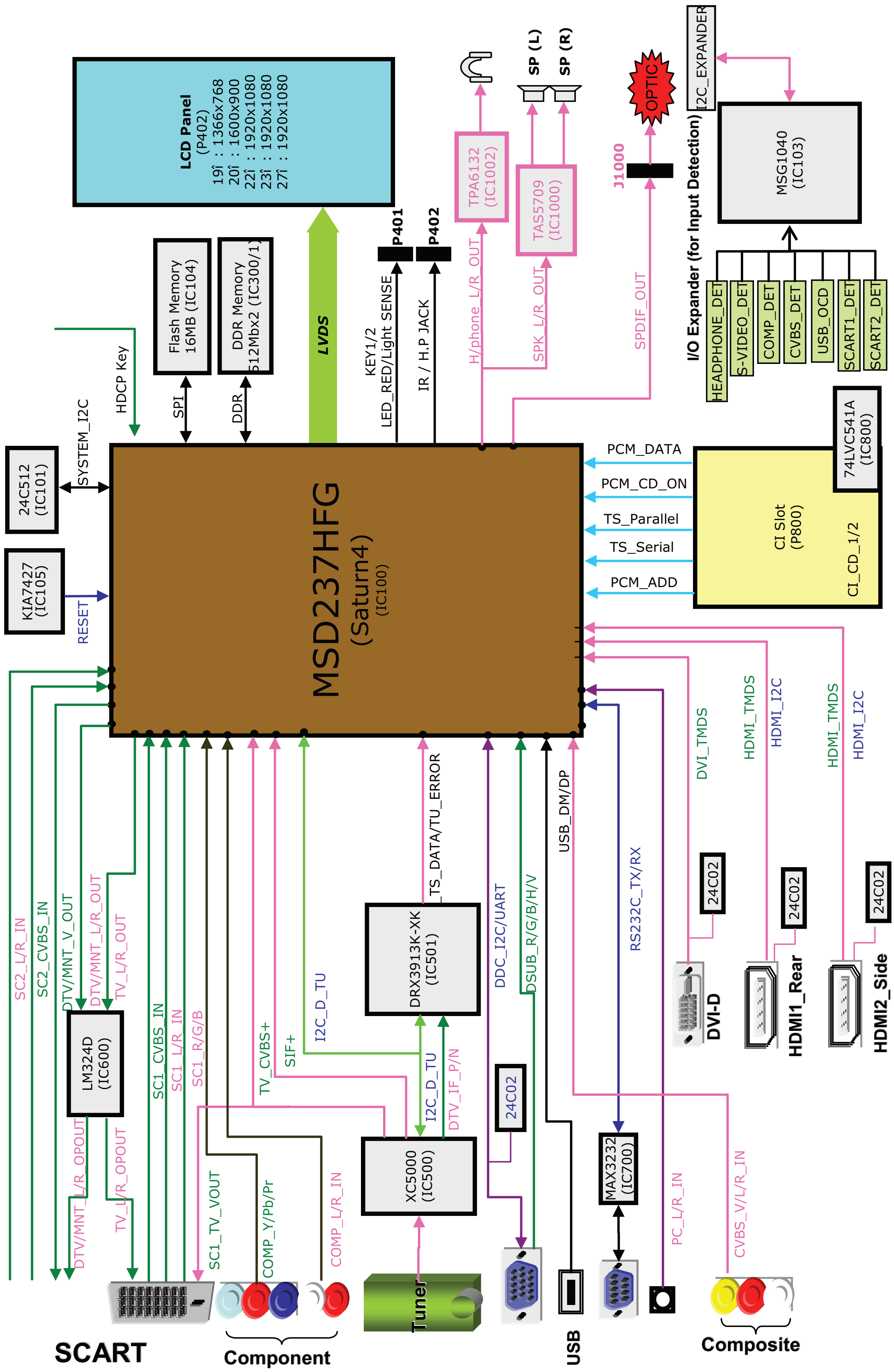
7.HDMI Video Trouble Shooting



8. All Source Audio Trouble Shooting



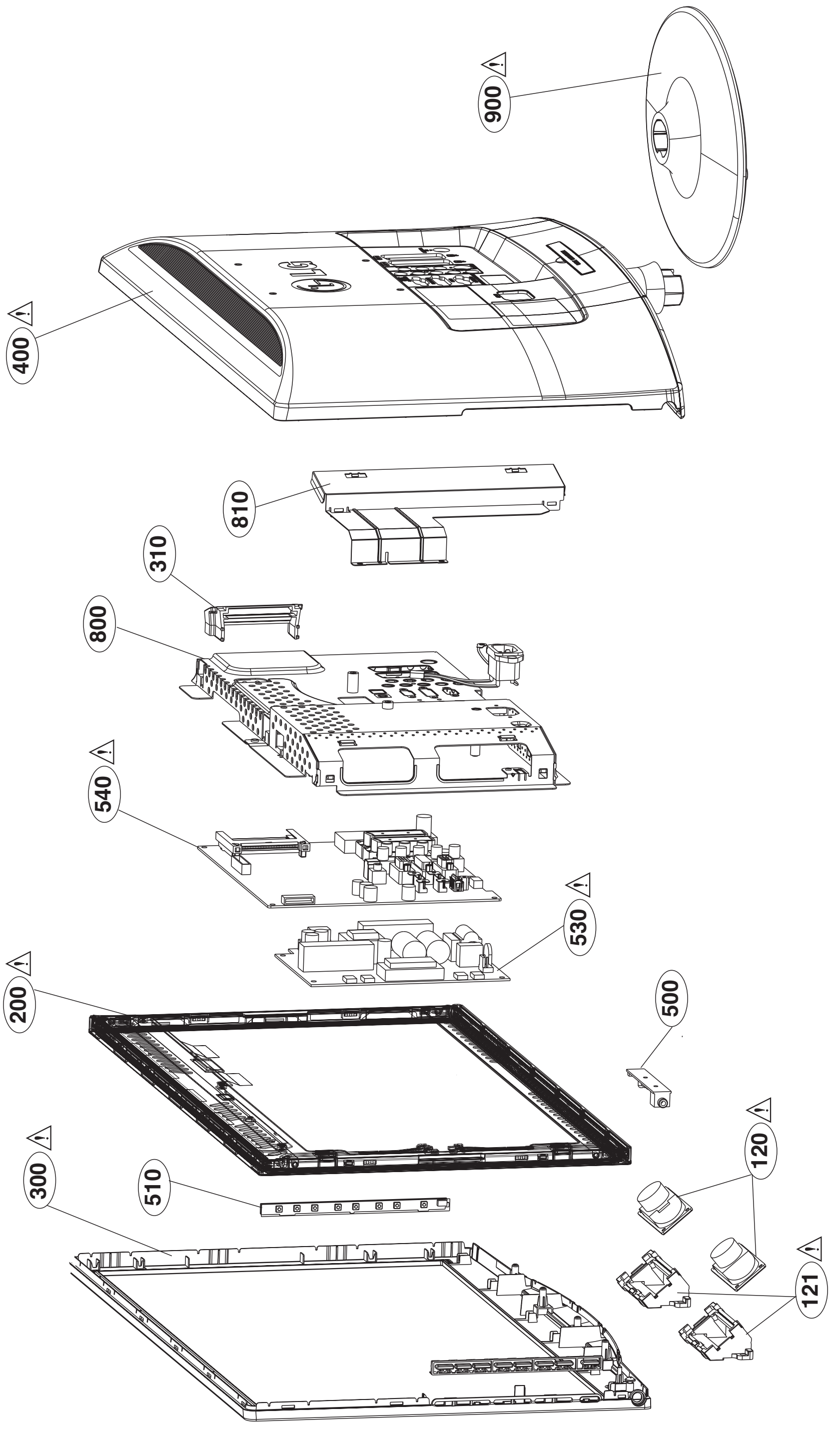
BLOCK DIAGRAM

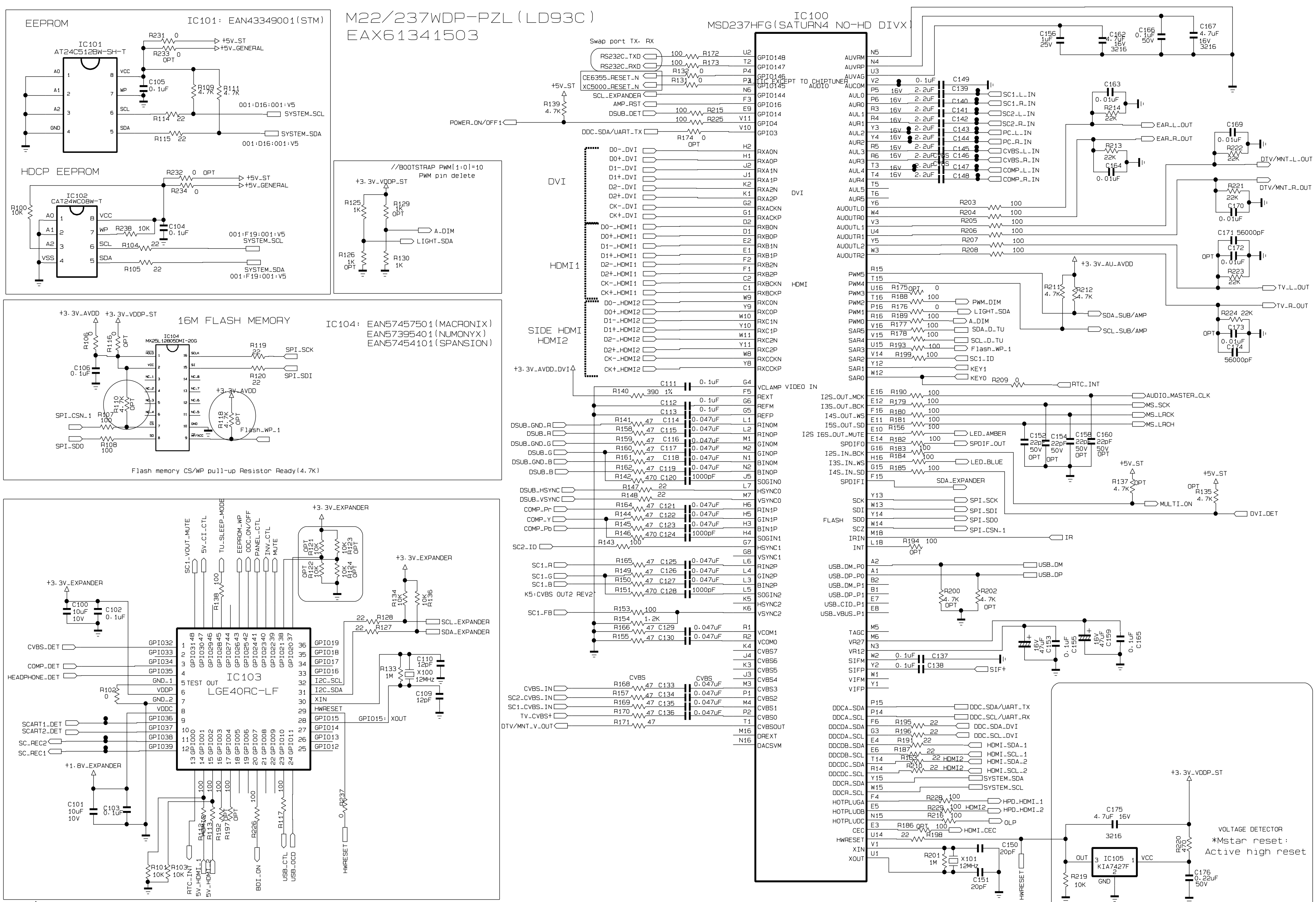


EXPLODED VIEW

IMPORTANT SAFETY NOTICE

Many electrical and mechanical parts in this chassis have special safety-related characteristics. These parts are identified by ⚠ in the Schematic Diagram and EXPLODED VIEW.
It is essential that these special safety parts should be replaced with the same components as recommended in this manual to prevent X-RADIATION, Shock, Fire, or other Hazards.
Do not modify the original design without permission of manufacturer.



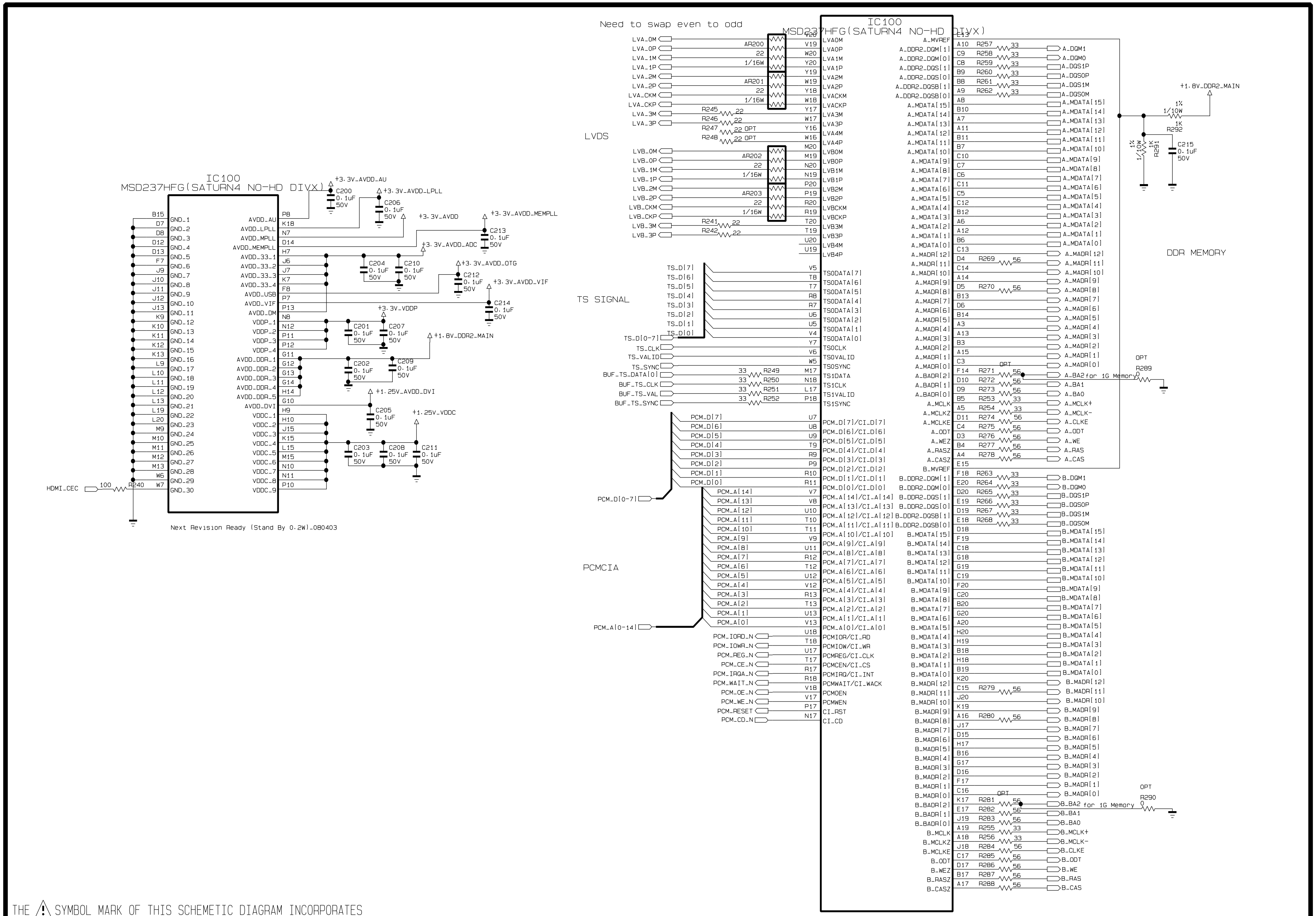


THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

SECRET
LG Electronics

LG ELECTRONICS

MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	MAIN_1	SHEET	1 / 11



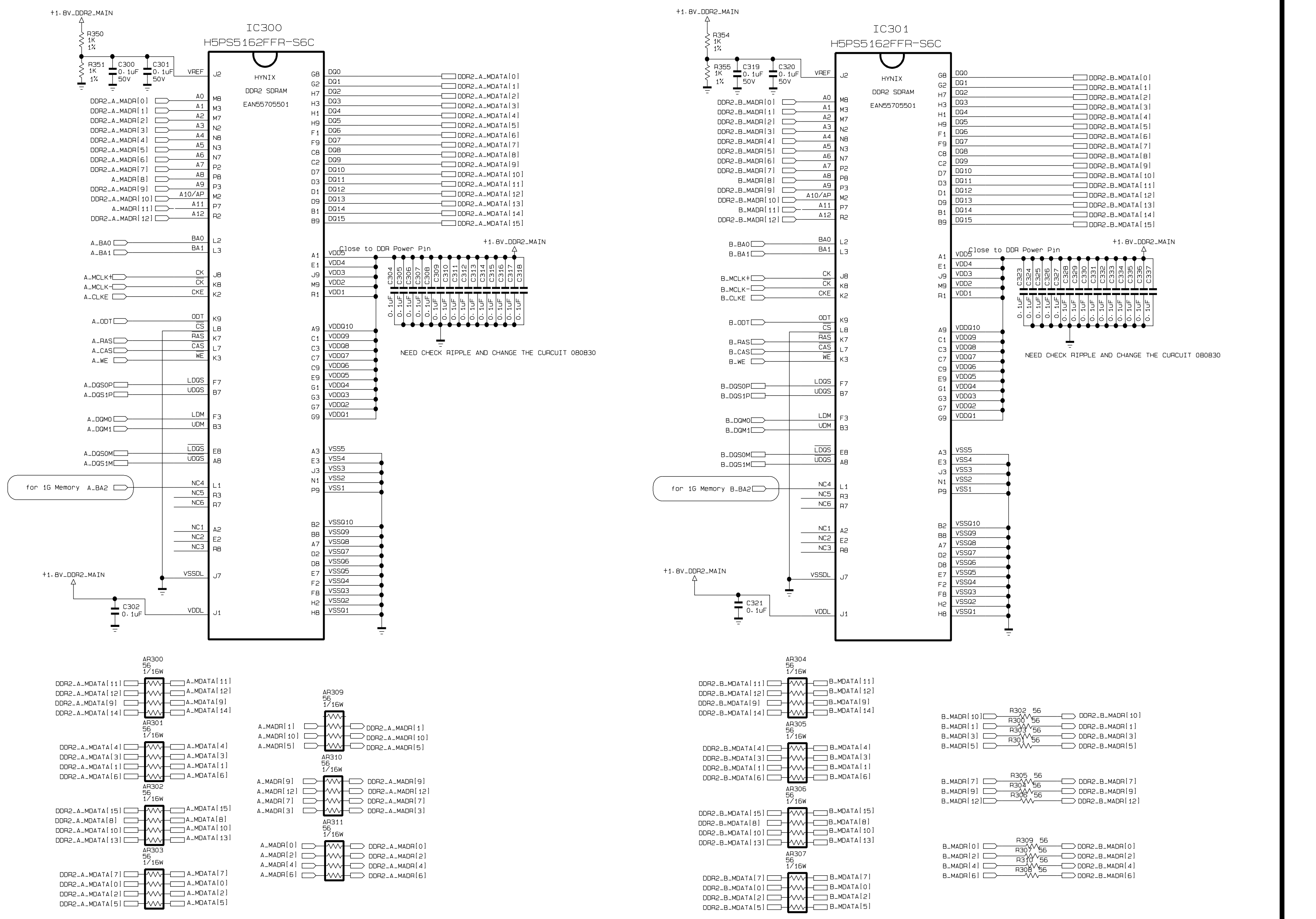
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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LG ELECTRONICS

MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	MAIN_2	SHEET	2 / 11



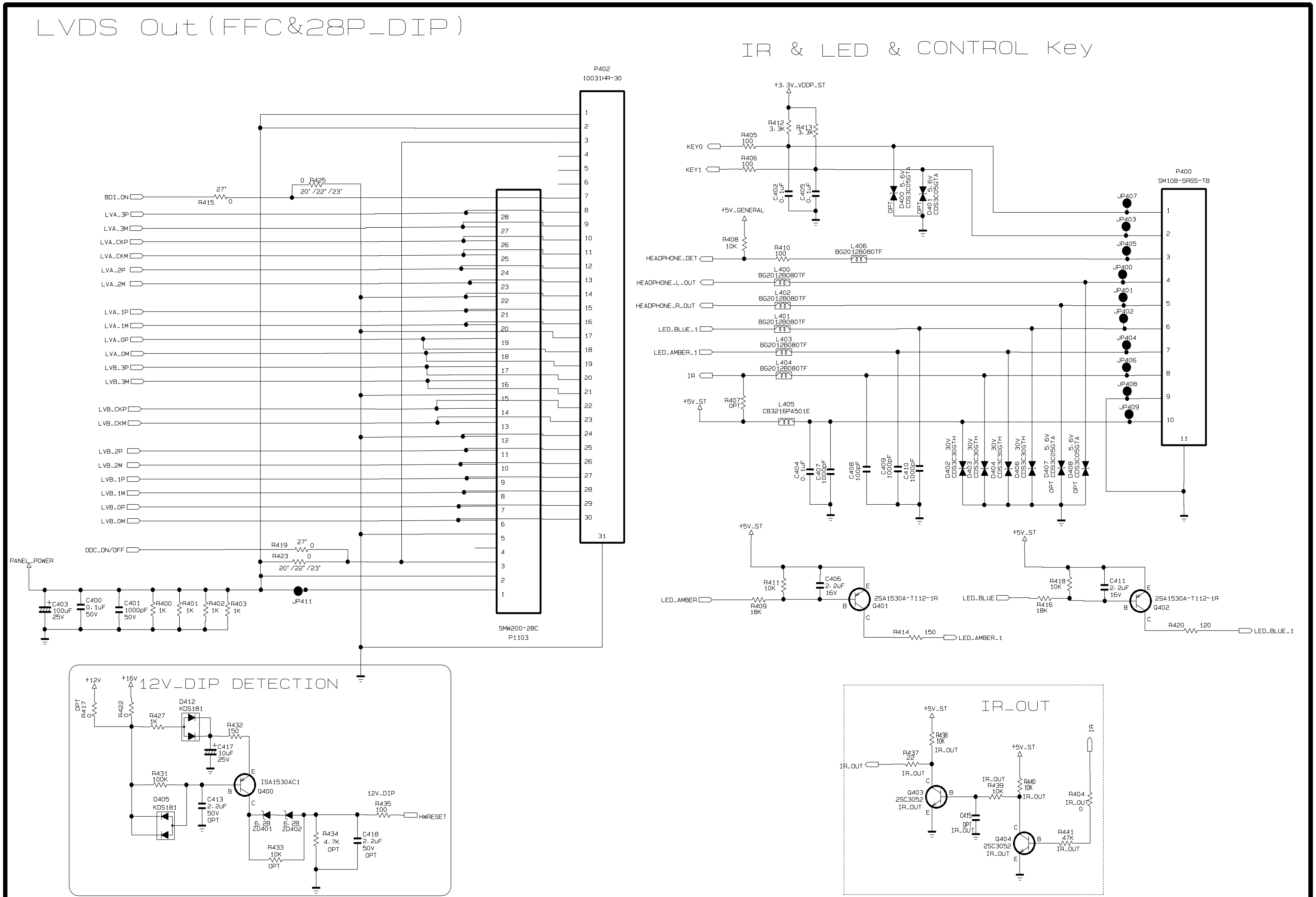
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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LG ELECTRONICS

MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	DDR2	SHEET	3 / 11



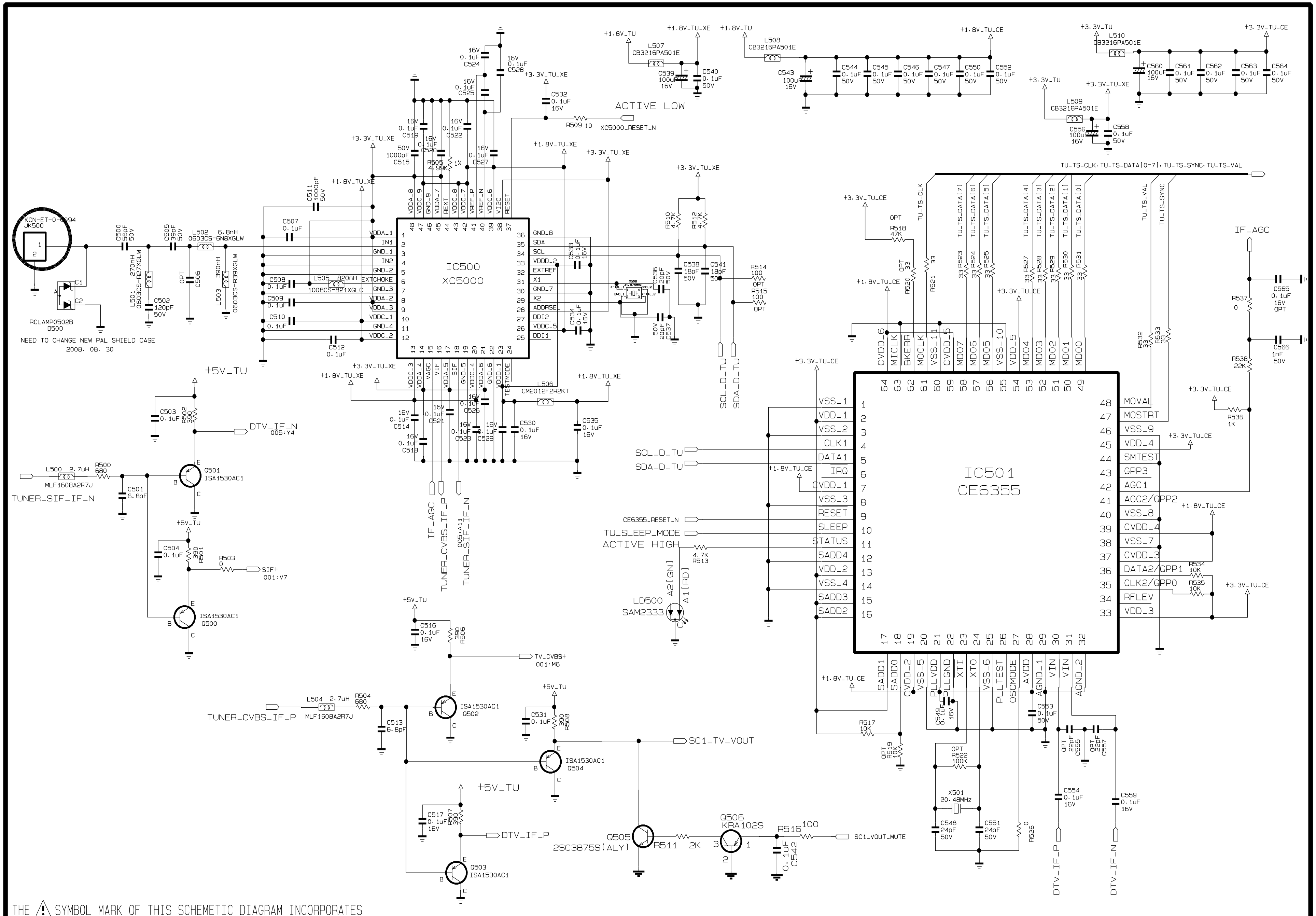
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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LG ELECTRONICS

MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	Module&Ctl	SHEET	4 / 11



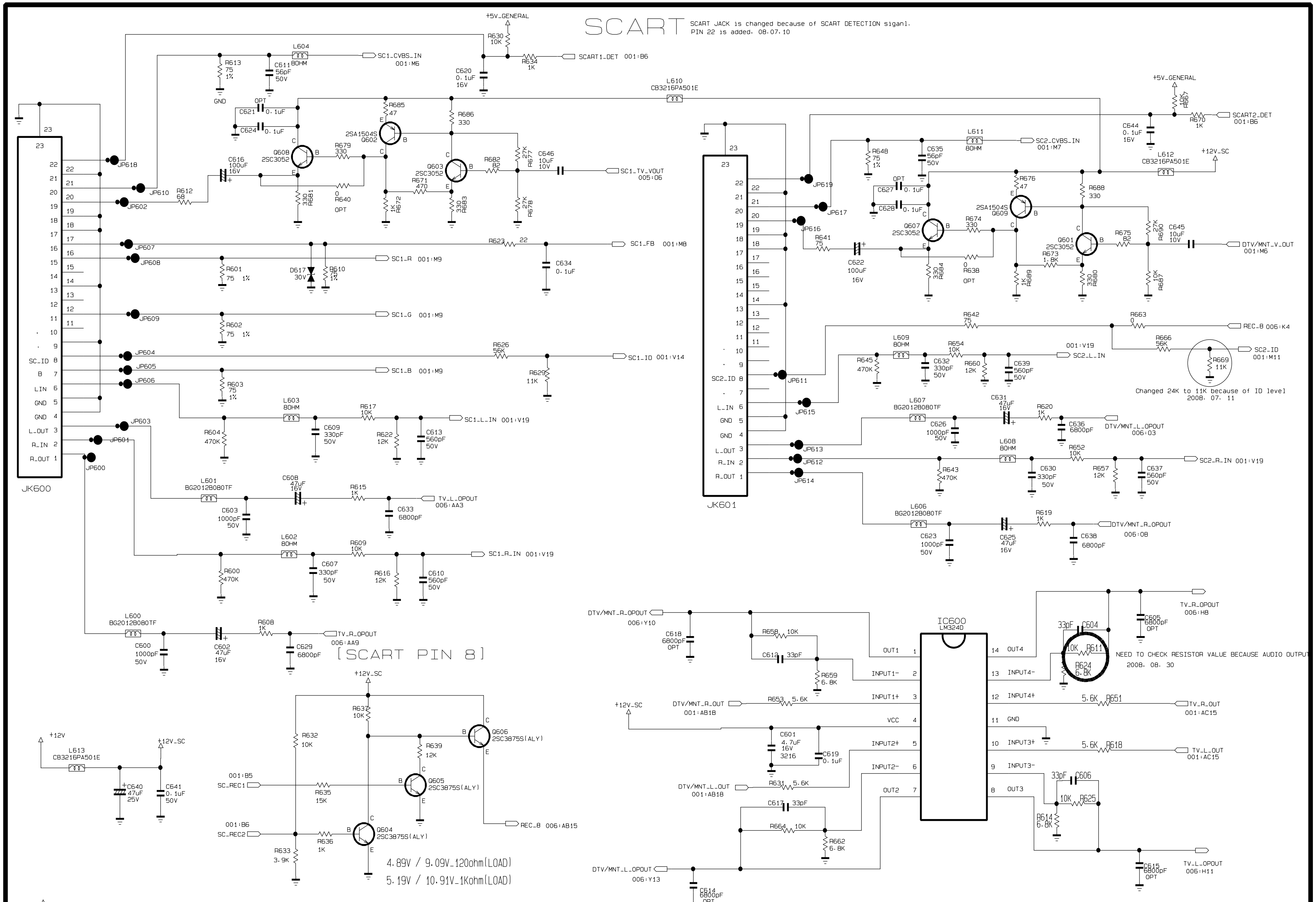
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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LG ELECTRONICS

MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	Tuner	SHEET	5 / 11



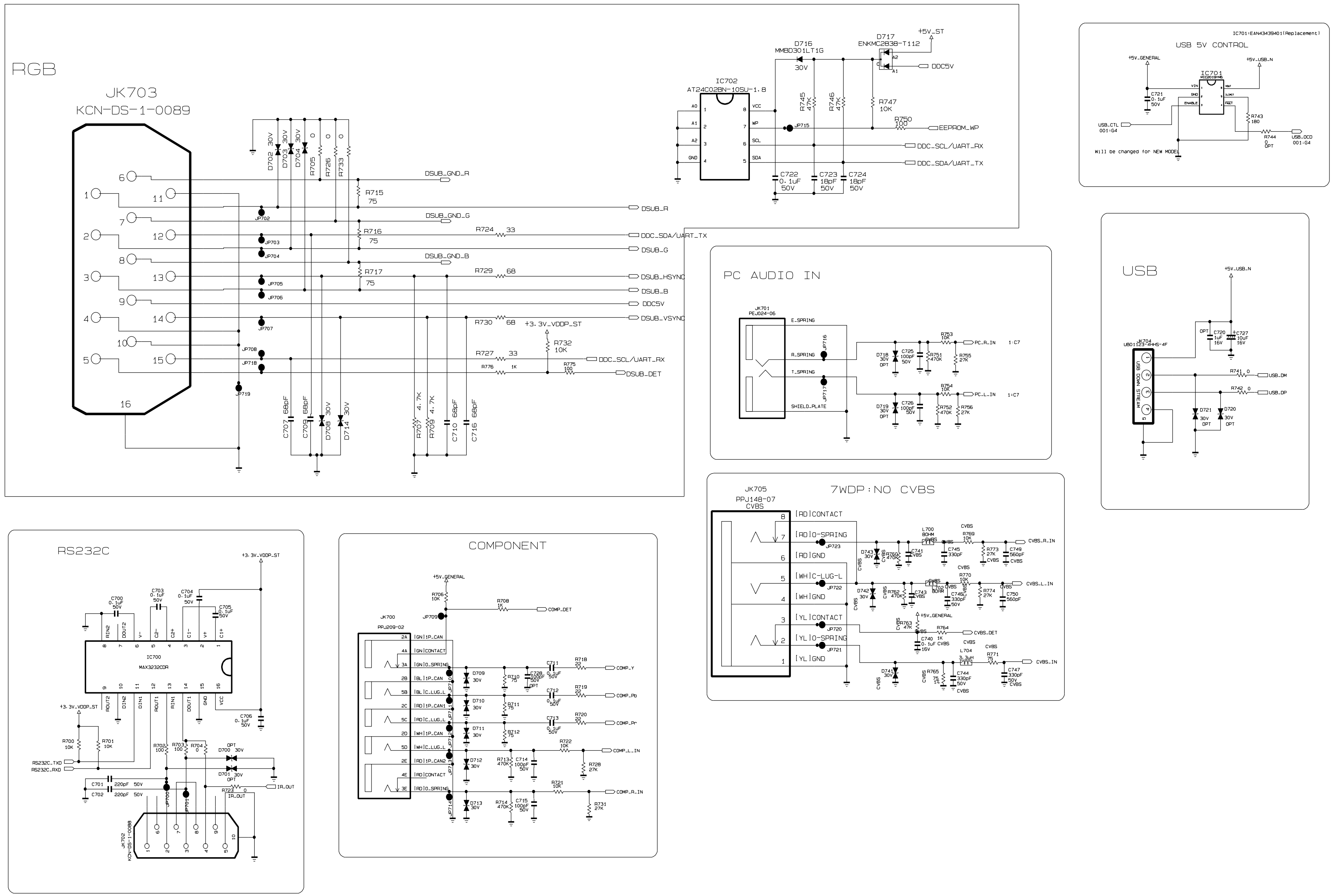
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MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	SCART	SHEET	6 / 11



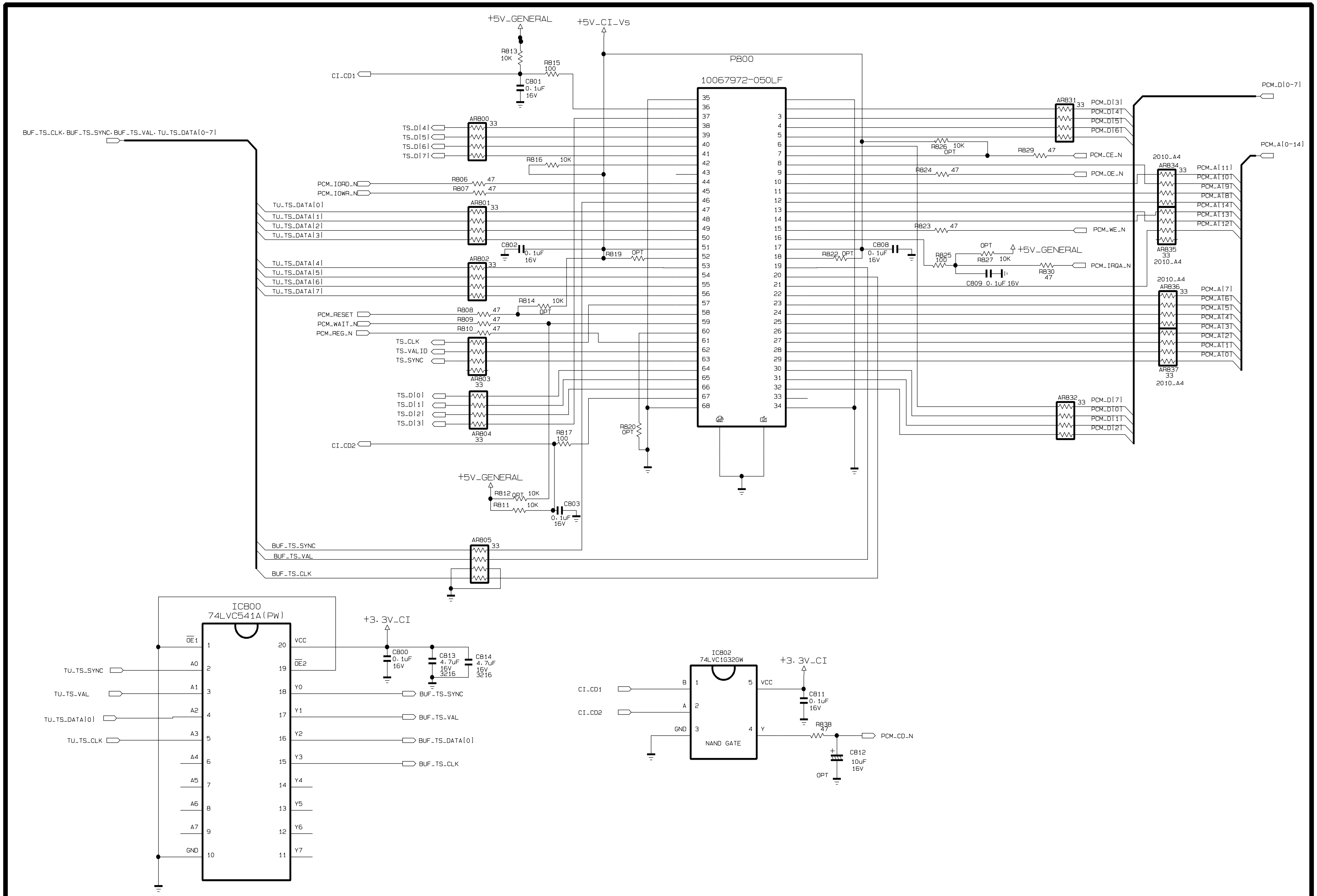
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	Interface	SHEET	7 / 11



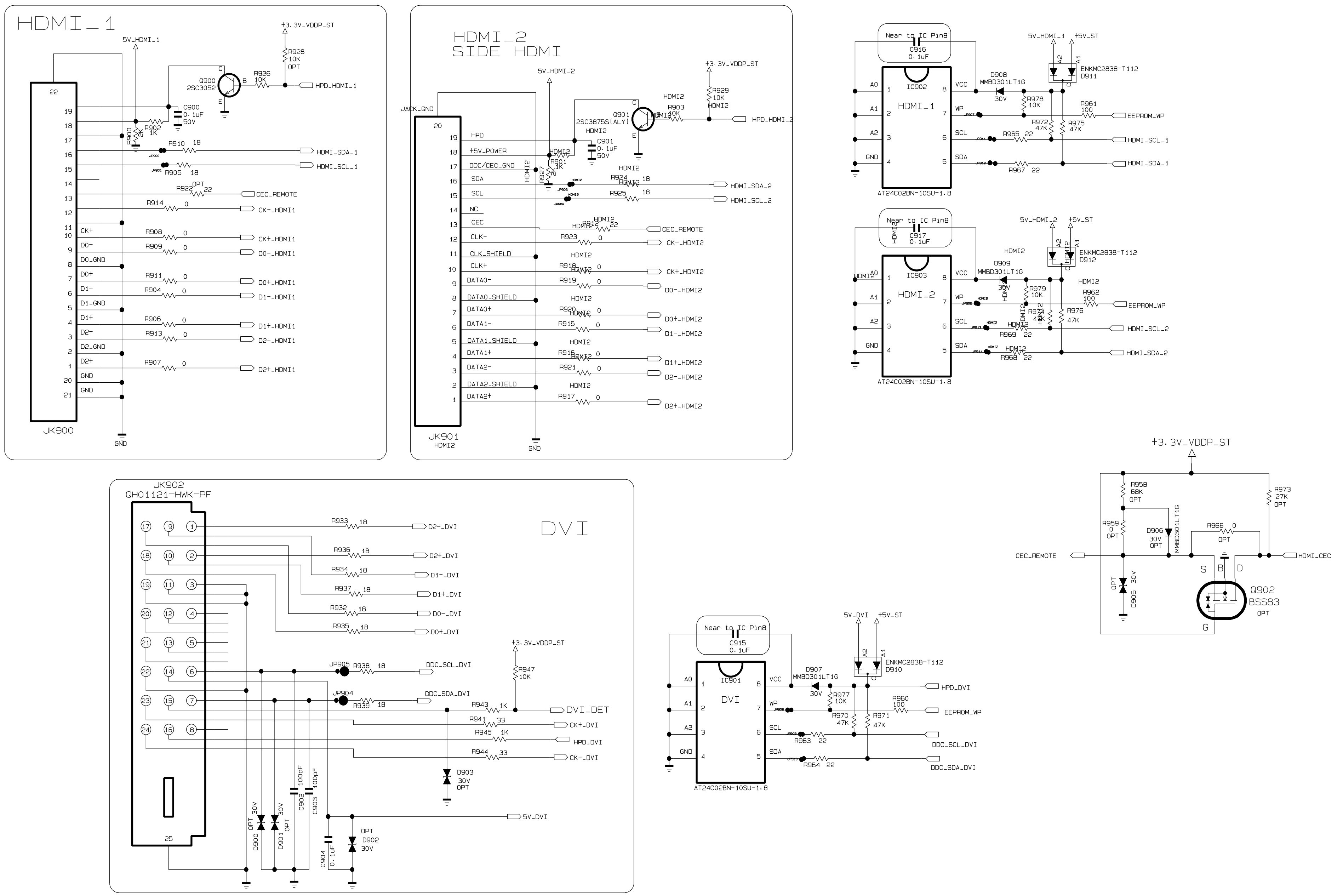
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LG ELECTRONICS

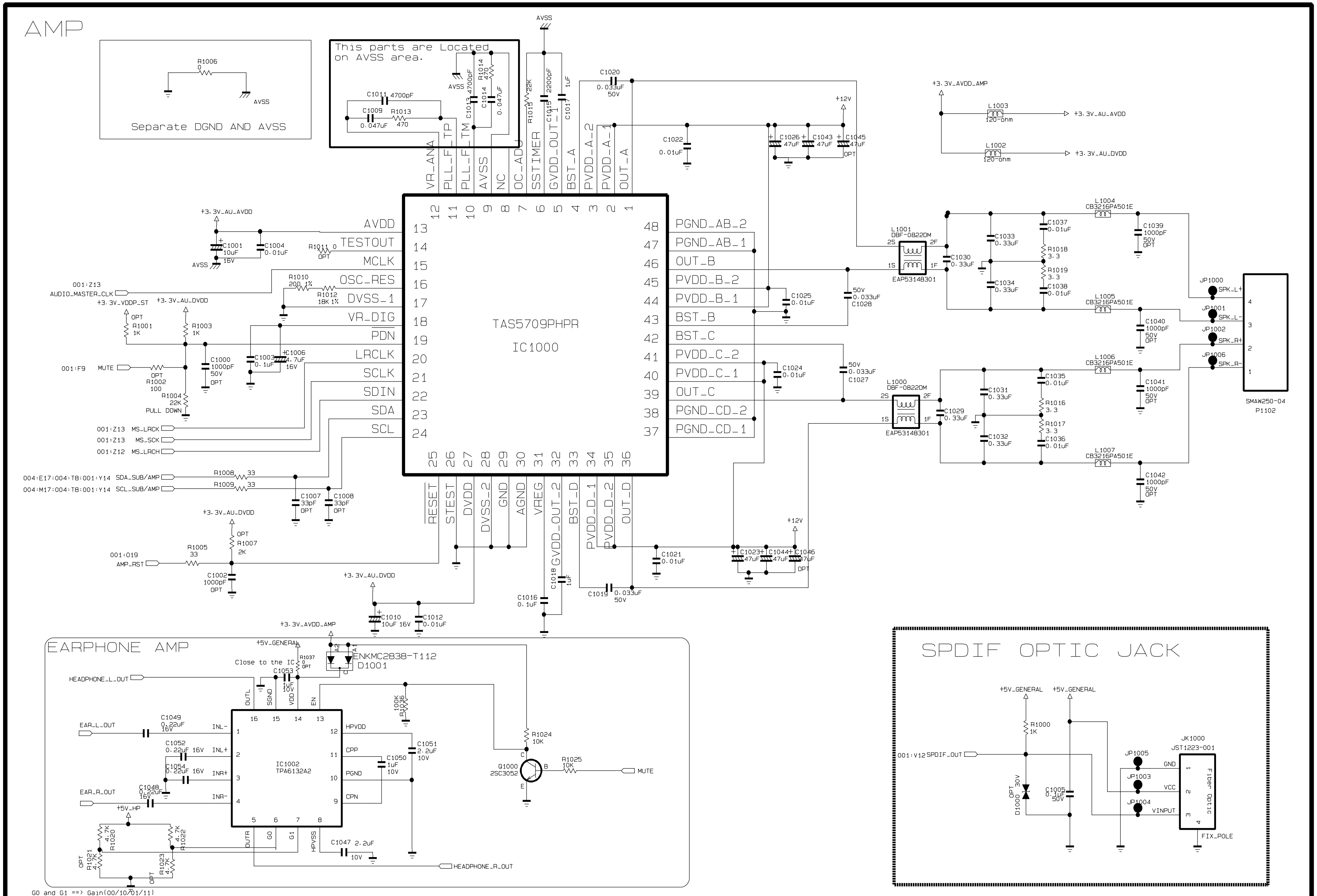
MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	PCMCIA	SHEET	8 / 11



THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION, FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.

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LGElectronics	

MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	HDMI	SHEET	9 / 11



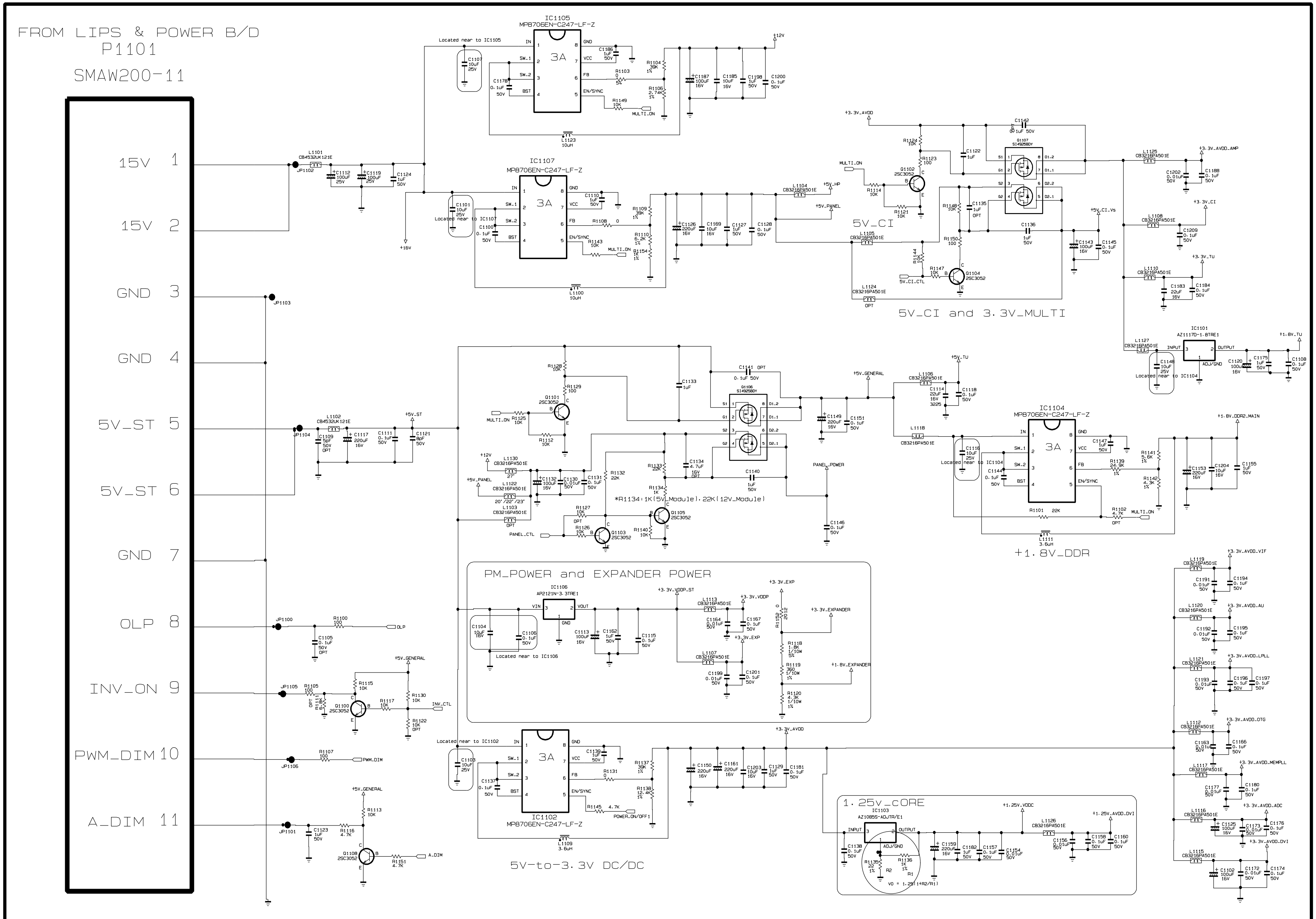
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MODEL	M22/237WDP	DATE	2009. 06. 12
BLOCK	AMP	SHEET	10／ 11



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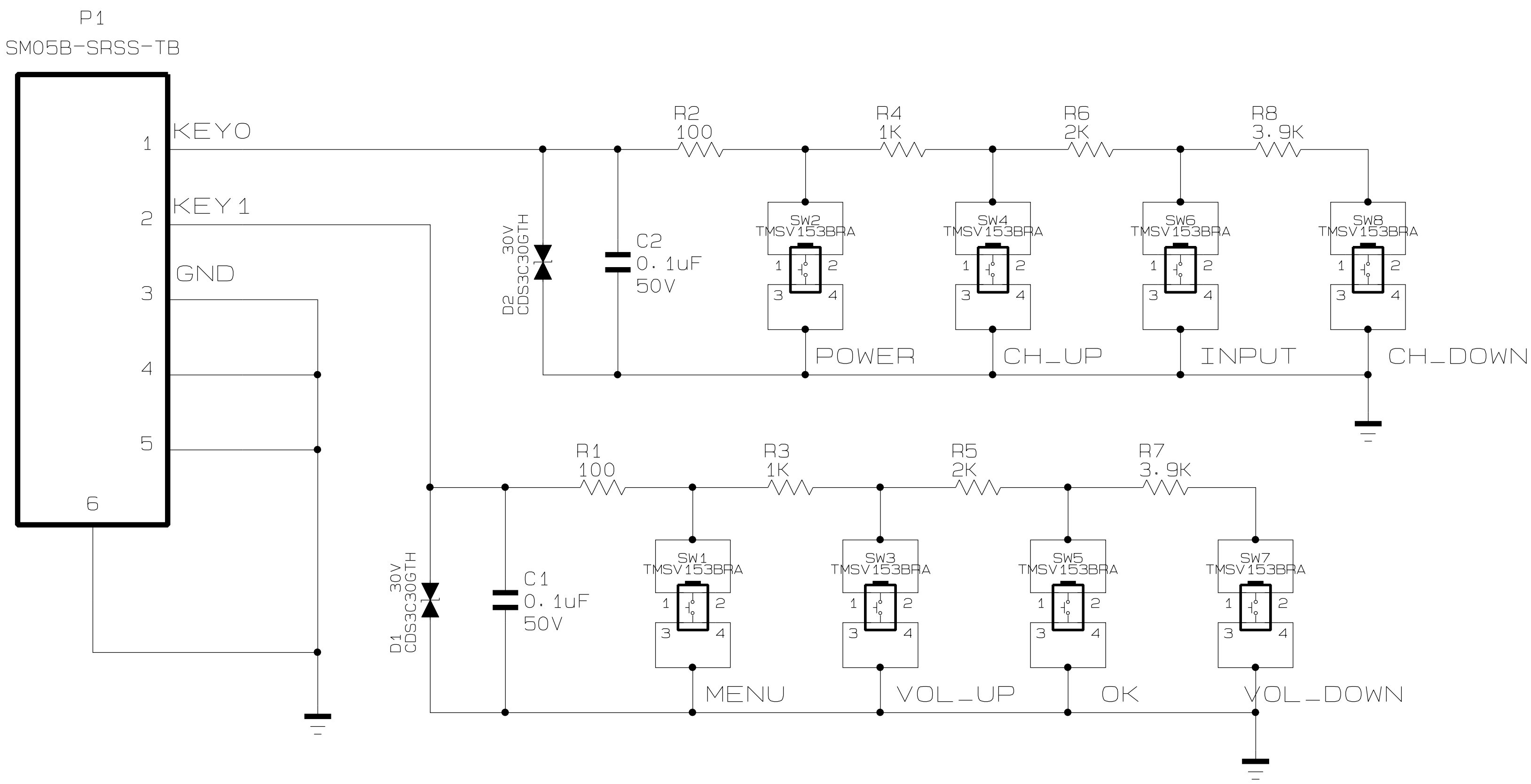
SECRET
LGElectronics

LG ELECTRONICS

MODEL	M22/237WDP	DATE	2009.06.12
BLOCK	Power	SHEET	11 / 11

M(19/22)7WDP CONTROL KEY

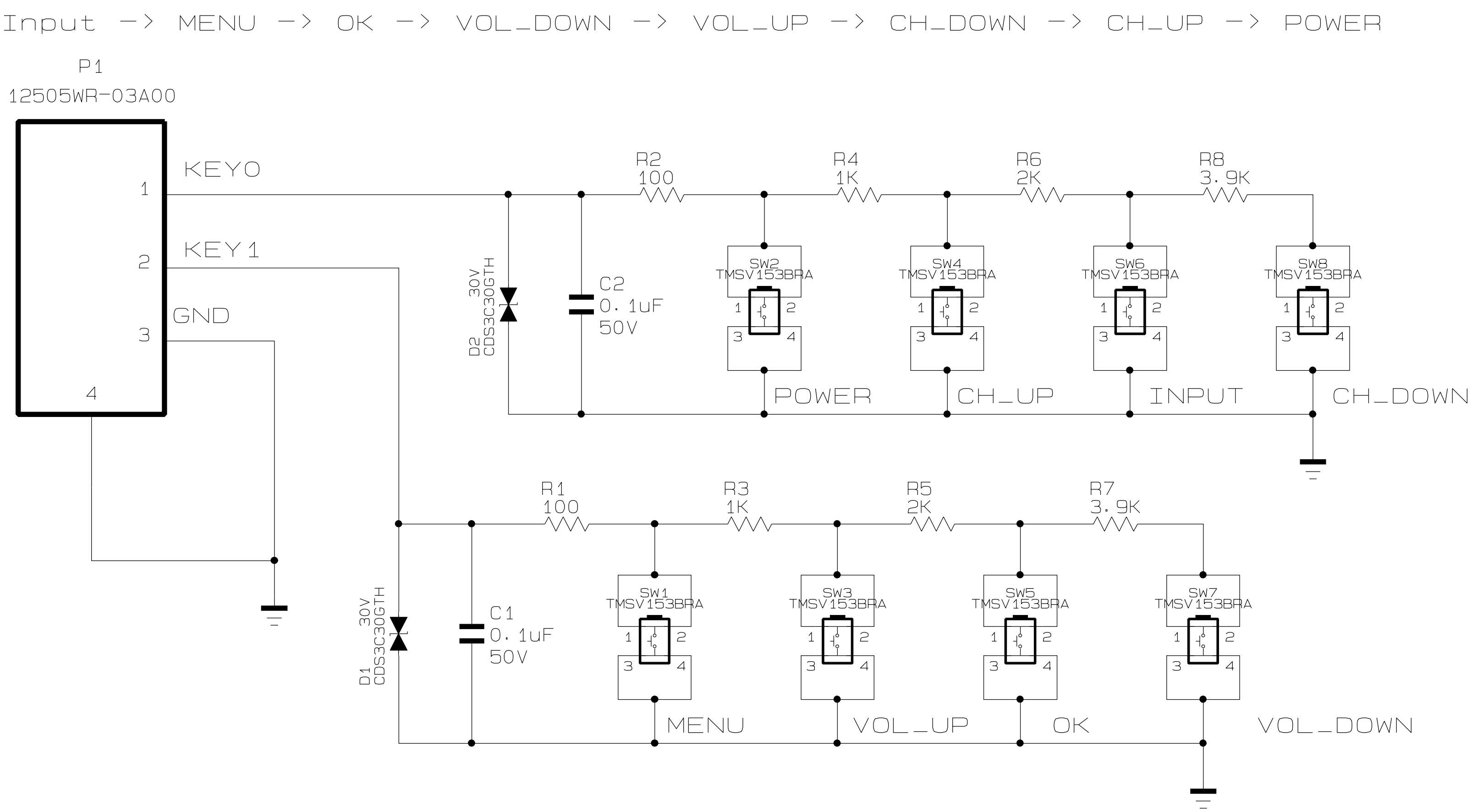
Input -> MENU -> OK -> VOL_DOWN -> VOL_UP -> CH_DOWN -> CH_UP -> POWER



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SECRET	LG ELECTRONICS	MODEL	M19/227WDP	DATE	2009. 06. 25
LGElectronics		BLOCK	CONTROL KEY	SHEET	1 / 1

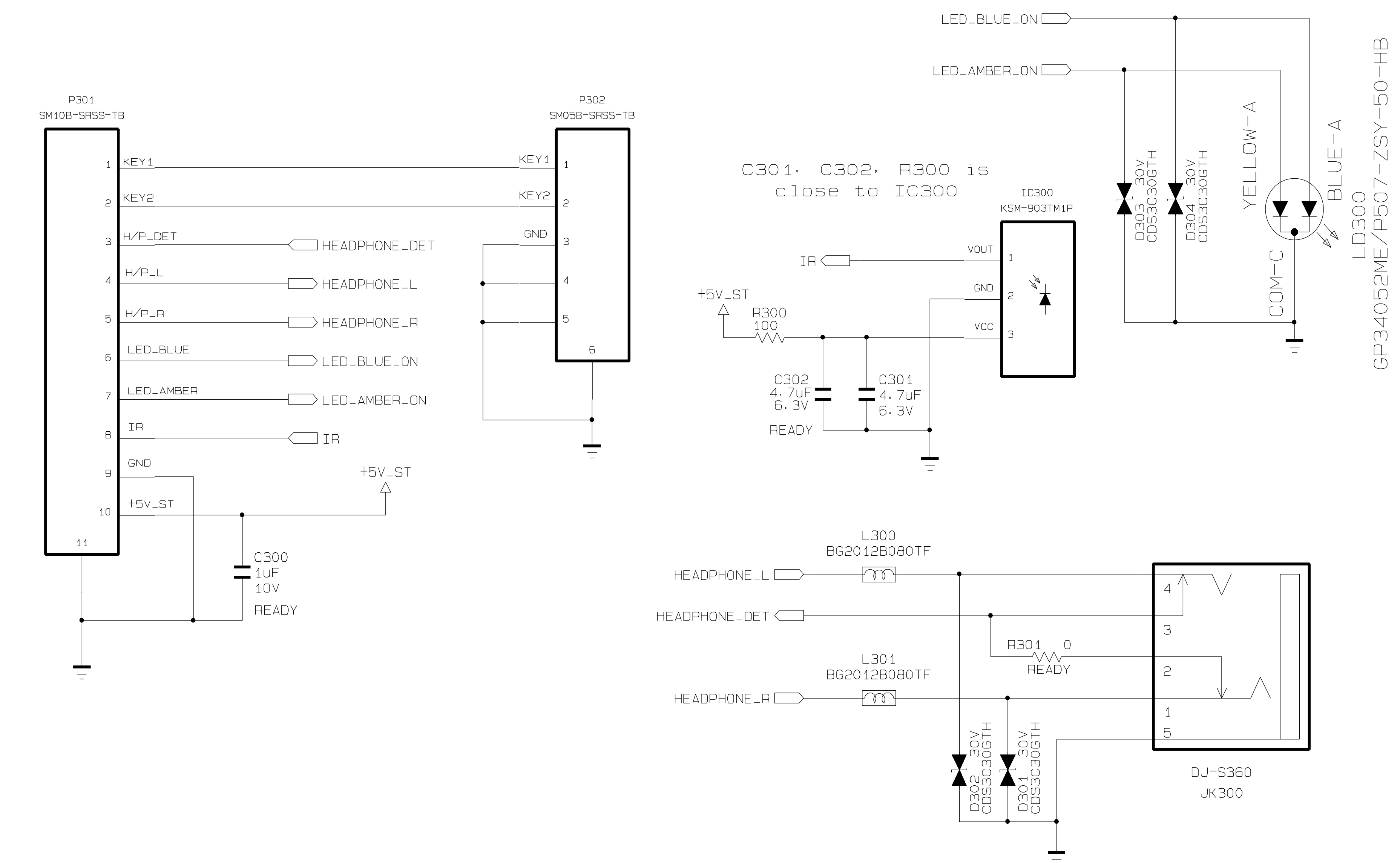
M237WDP CONTROL KEY



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SECRET LGElectronics	LG ELECTRONICS	MODEL	M237WDP	DATE	2009. 06. 25
		BLOCK	CONTROL KEY	SHEET	1 / 1

M19/227WDP
LED_IR_Head Phone



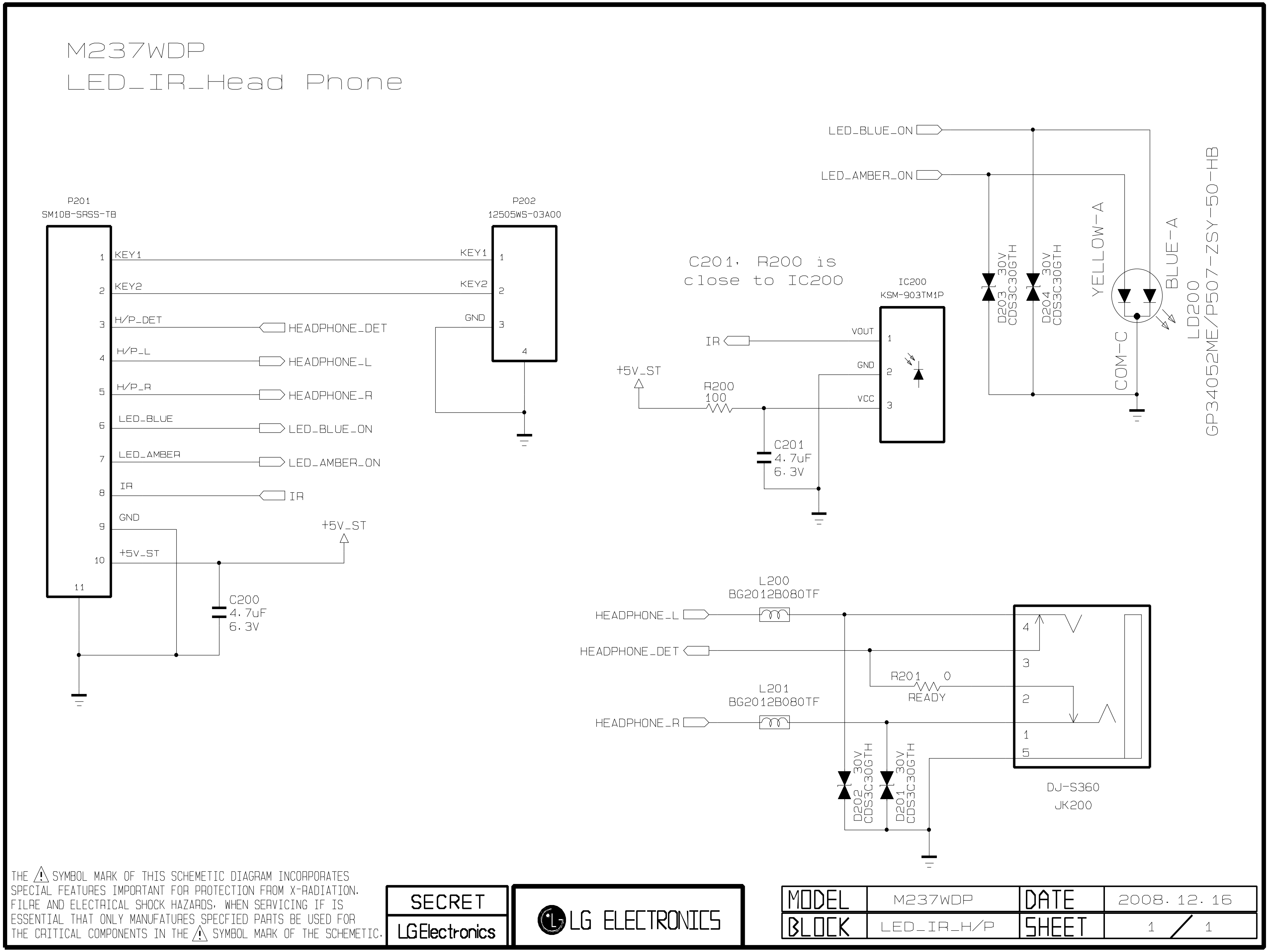
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LG ELECTRONICS

MODEL	M19/227WDP	DATE	2008. 12. 16
BLOCK	LED_IR_H/P	SHEET	1 / 1


M237WDP
LED_IR_Head Phone
P201
SM10B-SRSS-TB
KEY1
KEY2
H/P_DET
H/P_L
H/P_R
LED_BLUE
LED_AMBER
IR
GND
+5V_ST
HEADPHONE_DET
HEADPHONE_L
HEADPHONE_R
LED_BLUE_ON
LED_AMBER_ON
IR
+5V_ST
C200
4.7uF
6.3V
P202
12505WS-03A00
KEY1
KEY2
GND
C201, R200 is
close to IC200
IC200
KSM-903TM1P
VOUT
GND
VCC
IR
+5V_ST
R200
100
C201
4.7uF
6.3V
LED_BLUE_ON
LED_AMBER_ON
D203 30V CDS3C30GTH
D204 30V CDS3C30GTH
YELLOW-A
BLUE-A
COM-C
LD200
GP34052ME/P507-ZSY-50-HB
L200
BG2012B080TF
HEADPHONE_L
HEADPHONE_DET
R201 0
READY
L201
BG2012B080TF
HEADPHONE_R
D202 30V CDS3C30GTH
D201 30V CDS3C30GTH
DJ-S360
JK200
THE ⚠ SYMBOL MARK OF THIS SCHEMETIC DIAGRAM INCORPORATES SPECIAL FEATURES IMPORTANT FOR PROTECTION FROM X-RADIATION. FILRE AND ELECTRICAL SHOCK HAZARDS, WHEN SERVICING IF IS ESSENTIAL THAT ONLY MANUFATURES SPECFIED PARTS BE USED FOR THE CRITICAL COMPONENTS IN THE ⚠ SYMBOL MARK OF THE SCHEMETIC.
SECRET
LG Electronics
LG ELECTRONICS
MODEL
M237WDP
DATE
2008. 12. 16
BLOCK
LED_IR_H/P
SHEET
1 / 1

LG Electronics Inc.

Sep., 2009
Printed in Korea

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